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Improved Method for Molding Lathe Beds

Use of Cheek Bars Eliminated— Output Increased 50 Per Cent, With the Quality Decidedly Better

BY PAUL R. RAMP*

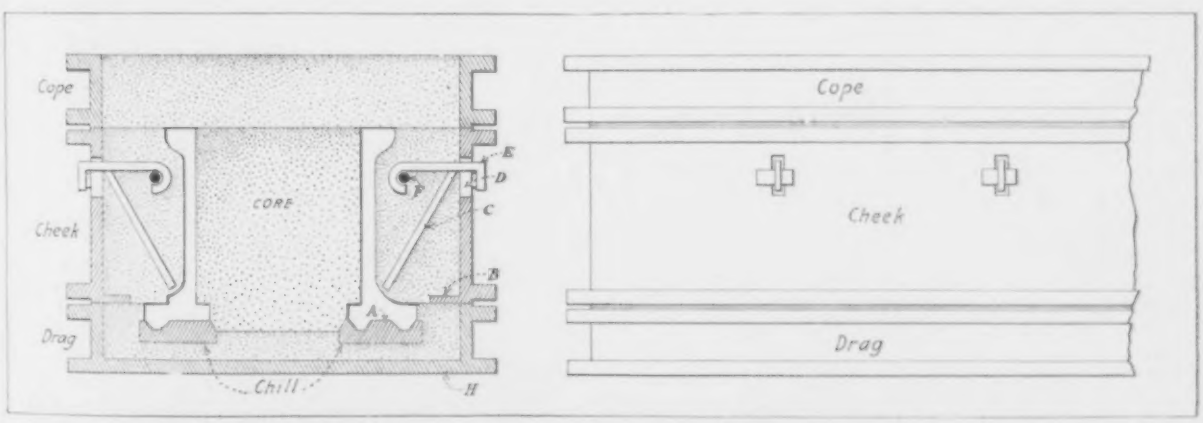
THE usual plan of molding lathe beds of the type here described consists in using a three-part flask. The cheek is made with chuck bars that reach in over the lower flange of the pattern. In order to carry the sand in the cheek it is generally conceded that these chuck bars should extend as far into the mold as possible and as close to the sides of the pattern.

With the chuck bars in the cheeks it is necessary to take the sides of the cheek off in order to get the casting out without breaking the chucks. This involves considerable work when a large number of bed molds are made daily. The fact that the cheek is made to take down daily renders it less solid than when the flask is made all in one piece. Otherwise many fallouts are the result. Another objection to the cheek flask with the chucks is the uneven surface they produce if the molder is not very careful in tucking around them. Every soft spot then becomes very prominent when the casting is painted.

The object of this article is to describe an improvement in the method of molding these castings which not only produces a more perfect bed but enables the molder to increase his daily output 50 per cent.

Our plan is to cut out the chuck bars and use a sand strip along the inside bottom joint of the cheek. Fig. 1 is a cross section of the mold of a lathe bed rammed, with pattern out and cores placed, ready for casting. The sand strip referred to is shown at *B*. One row of gaggers, indicated by *C*, on either side of the pattern, is all that is required to carry the sand besides the sand strip, except the two support rods shown at *F*. The arrangement for holding the support rods is a clamp, *E*, which extends through a slot in the side of the flask. The support rods are laid in after the cheeks have been rammed two-thirds of the way. They are tapped down snugly with the rammer and the rod clamps are put into position and the ramming of the cheek is concluded.

Before the pattern is drawn from the mold, the rod clamps are firmly wedged on the outside of the cheek. This plan is very effective and simple and it can readily be seen that there is no excuse for soft spots on the surface of the molds since the chuck bars are not in the way to prevent uniform ramming.



The Cross Section (Fig. 1) Represents the Mold of a Lathe Bed Rammed, Ready for Casting. The other view (Fig. 2) is a part of a complete flask with rod-clamps extending through and showing how they are wedged

We were able to get two beds, 10 ft. by 18 in., from one molder and one helper, with the old method of take-down cheeks with chuck bars, and we had considerable complaint about the uneven surface under the bars. With the new method using no chuck bars, as here described, we are able to get three of the same beds with the same number of men in one day. Fig. 1 was a bed that we were obliged to make with chilled vees. In this case it was not good practice to roll the drag over and the chills were bedded in the drag on very hard-rammed new sand.

As the bedding of these chills entailed considerable time and expense, we made the drag part of our flask solid as shown here, that is to say, the

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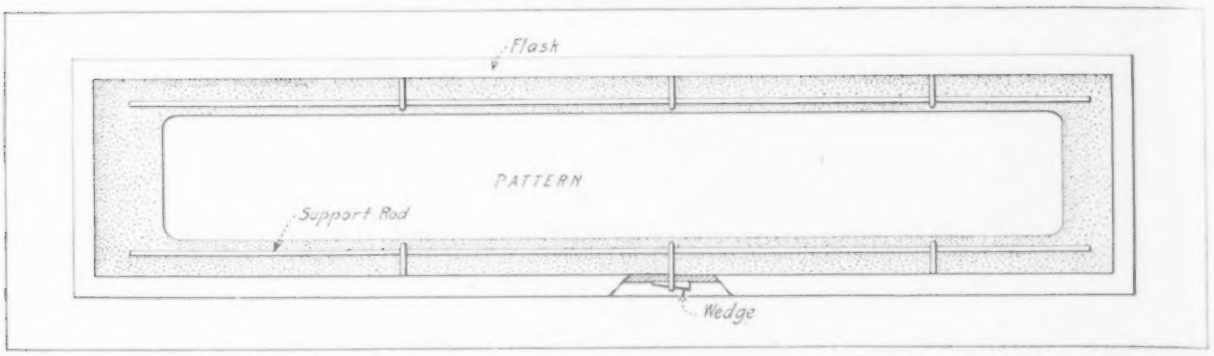


Fig. 3—A View of the Cheek Only Two-thirds Rammed. It also shows another view of how the rod-clamp is wedged

bottom plate was cast on the drag part of the flask, shown at *H*. When we desired to put another job on the floor occupied by these all that was necessary was to hook the crane on the drag and move it, sand chills and all, without disturbing the chill layout in the least. *D* is the slot cast in the side of the cheek to allow the rod-clamp to extend through.

Fig. 2 shows a part of a complete flask of this kind with the rod clamps extending through. It also shows how they are wedged. Care must be used in driving these wedges. If they are drawn too tight the support rod will be pulled away from its position and a cavity formed on the side of the rod next to the mold surface which will result in a long bad swell. The best plan is to lightly tap these wedges or to push them in between the flask and the toe of the rod-clamp with the hands.

Fig. 3 is another view of the cheek only two-thirds rammed. The support rods are placed in position and the ramming of the cheek will be finished. This sketch also shows another view of how the rod-clamp is wedged, although this wedge is not securely placed until all of the mold has been rammed.

While a few may not agree with us regarding this method of making these castings, we believe it will be of value to many. We introduced this plan in a foundry that had the reputation of getting more lathe bed molds out of one man than any other shop in the country and we were able to secure a production per man that equaled 50 per cent more than their best record. The quality of the work was improved in the manner referred to above.

A 20-In. Crank-Driven Shaping Machine

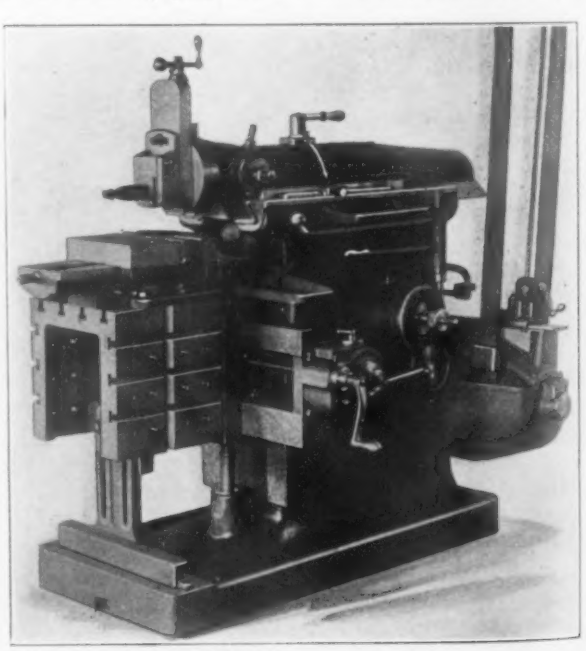
The Hendey Machine Company, Torrington, Conn., has added a 20-in. shaping machine with crank drive to the line built. The frame and base are cast in one piece, and an expanding friction clutch drive engaging with the cone pulley on the back of the machine is used.

A single casting forms the frame and base, an oil pan inside the latter being relied upon to catch the drip from the bearings and keep the floor clean. The hub for the bull gear is cast integral with the frame and takes the strain set up in the drive by the cut. The crankpin is hardened and ground on all wearing surfaces, as is the crankpin block and the bearing for the pin is bushed with a cast-iron sleeve.

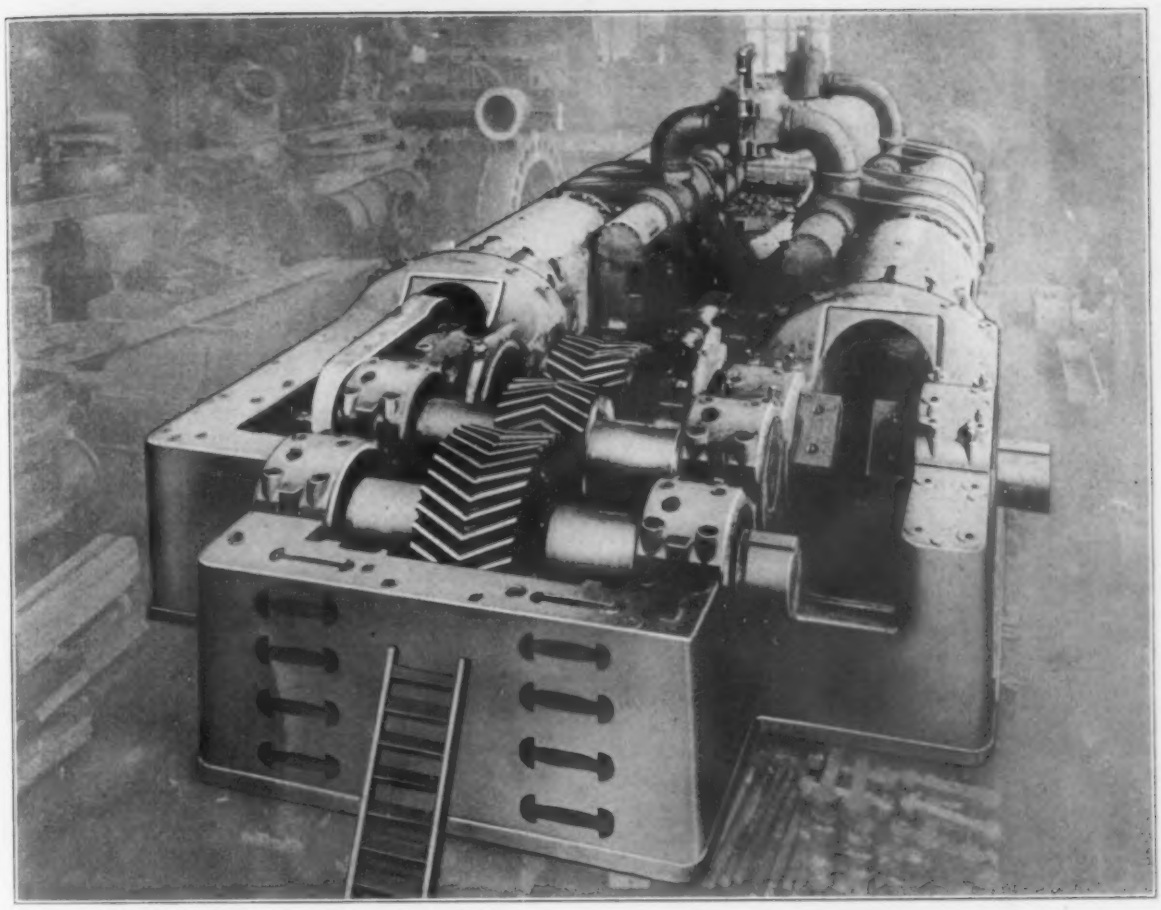
The ways for the ram in the frame are planed from the solid metal and have an angle of 50 deg. The gib for the ram is combined with the cap in a single casting, thus, it is explained, making it rigid and at the same time providing for adjustment in a horizontal direction. The bearing of the ram in the frame measures 11¼ x 34 in. The ram is a casting reinforced with bracing for heavy cuts and can be set in any position, either while it is in motion or idle, the length of the stroke being shown on the index, the maximum being 20¾ in. The cross feed has a range of from 0.008 to 0.200 in. arranged in 25 steps. The amount of feed is controlled by a dial and indicator and can be varied while the machine is in operation. The ball lever on top of the casting enables the feed to be thrown out, engaged or reversed without stopping the machine. The mechanism is operated entirely at the end of the cross-rail, irrespective of its position, and the feed takes place when the ram is making its return stroke. A square lock serves to clamp the cross-rail to the column and a telescopic elevating screw raises it through a distance of 15 in. The tool head swivel is bound to the head of the ram by a single screw. A screw down feed is provided with a micrometer dial reading to thousandths of an inch and power down feed is optional.

The table has an adjustable bottom support which slides on a channel-shaped track, the horizontal travel being 24½ in. This arrangement is relied upon to protect the track from chips and dirt that might throw the table out of alignment. A graduated base, which is held down by four bolts, is provided for the vise and also acts as a clamp to hold the vise down to the table. The vise ways are supported on the table by a boss cast on the underside of the vise, which also serves to tie the ways together and give added stiffness. The thrust of the screw controlling the movement of the sliding jaw is taken at the head end of the vise casting. The vise jaws measure 2 7/16 x 12 in. and the opening of the vise is 13 in. The top and sides of the table are provided with T-slots and measure 16 x 20 and 15 x 16¼ in. respectively.

The long horizontal lever at the side of the frame provides for the engagement of a large-diameter expanding friction clutch drive with a four-step cone pulley. Back gears are provided, giving eight speeds to the ram ranging from 8 to 115 strokes per min.



Adjustable-Speed Motor Drive with a Silent Chain, Constant-Speed Motor Drive with a Gearbox or a Belt Drive, in Which the Belt-Shifting Mechanism Is Operated by Cams, Can Be Furnished for This 20-In. Crank-Driven Shaping Machine



Reversing Engine for Driving a 58-In. Beam Rolling Mill Developing between 30,000 and 35,000 Hp. and Having the Low-Pressure Valves Drive the High-Pressure Valves Direct

Either motor or belt drive can be employed with the machine. If the former is used it can be either of the adjustable-speed type, the power being transmitted through a silent chain, or the motor used can be of the constant-speed type with a gearbox for furnishing the various speeds. With the belt drive a special belt shifting mechanism is provided in which the cams are arranged to move the shifters alternately, an arrangement that it is emphasized changes the belt much quicker than when the work is done by hand.

Citizenship Training at Midland, Pa.

The co-operation of officials of the Pittsburgh Crucible Steel Company with the municipal authorities at Midland, Pa., where its plant is located, has resulted in the establishment of an effective campaign to raise the standard of citizenship in that city. One of the principal steps in the inauguration of this movement was the recent opening of a Carnegie library containing over 2500 volumes. In dedicating the edifice, T. J. O'Donnell, superintendent of construction of the Pittsburgh Company and president of the local school board, outlined some of the methods adopted as follows:

"We have and must have in every manufacturing town many people who do not understand and speak our language. In my dealings with these people I am often impressed with their keen humanity and great desire to learn and understand our language. For that reason the school board on recommendation of one of the most interested officials of the Pittsburgh Crucible Steel Company has been for some time in correspondence with the Department of Labor and Naturalization at Washington and has established citizenship schools which are conducted at night. The readers used at these schools have been selected with great care and the subject matter pertains especially to the laws of the country and the requirements of good citizens. The course outlined will enable our foreign-born townsmen not only to acquire within two years intelligence on the most important subject of American citizenship, but to read and write our language intelligently."

35,000-Hp. Reversing Engines for Bethlehem Shape Mills

The William Tod Company, Youngstown, is completing two twin tandem compound reversing engines for the Bethlehem Steel Company, South Bethlehem, Pa. These engines are designed to run 58-in. Gray beam mills, will develop between 30,000 and 35,000 hp. each and are stated to be the largest reversing engines ever built in the United States and possibly in the world. The high-pressure cylinder is 46 in. in diameter; low-pressure cylinder, 76 in. and stroke, 72 in. Many improvements have been worked out on these engines to make them more economical in regard to steam economy and upkeep, as there was much to be accomplished in this respect over previously designed engines of this type. The principal features are the Walschaert valve gear, the high-pressure valves being driven directly from the low-pressure valves and eliminating all intermediate rockers, links, and parts subject to wear and likely to work loose and cause trouble. The cylinder clearance is kept to a minimum for steam economy.

The control of the engines is of the Tod patent single-lever type interconnecting the throttles for high and low pressure cylinders with the reversing gear. The cut-off at the opening of the throttle is a maximum and is gradually shortened until the throttle is wide open, the cut-off then being about 40 per cent of the stroke. Any further movement of the throttle increases the cut-off to a maximum to give a large torque. This, it is emphasized, is a decided advantage to prevent stalling the engine when there is a sudden demand for more power, in which case the usual method is to reverse and in mill terms "take a run at it" often resulting in broken rolls, spindles, pinions or housings.

The engines are also designed to conform with modern safety laws, protecting operators and attendants, all moving parts being completely covered by substantial guards.

Deliveries of Austrian steel companies in 1916 were 904,000 metric tons, exceeding the record year 1912, when they were 830,000 tons.

Preparing American Industries for War*

Plan Proposed for Rapidly Organizing Our Factories, Workmen and Engineers for Maximum Production of Means of Warfare

BY ROBERT THURSTON KENT†

WE have examined the problem which will confront the country in the event of war. Let us now examine its solution.

The Solution

The keynote of the writer's plan for the preparing of the industries and technical skill of the nation for war is organization. We have, without doubt, already at hand the means of making practically everything that we will need in war. We have the factories, the skilled workmen, the raw materials, all within our own borders. There is little, if anything, that we would require that we would have to import from outside the country, excepting perhaps rubber. We have only, then, to learn what we have available, and to learn how quickly to make use of it. This can be accomplished rapidly if we have the proper organization.

The Facts to Be Learned

The organization that is needed is one that will first discover certain fundamental facts, and then ascertain how best to act on those facts. Among these are: 1—What are the items of equipment that must be manufactured for the army and navy? 2—In what quantities must each of these items be supplied? 3—When must deliveries begin? The answers to these questions can be given, most of them at once, by the military and naval authorities.

In putting these questions to the several departments and bureaus that must answer them, it should be made plain that the answers must be specific in regard to the last two questions at least, in order that the plans for manufacturing can be made so that production can be carried on with a maximum of speed and efficiency. For example, if the army is to consist of 1,000,000 men, requiring, say, 5,000,000 rifles, the report on this subject should state how soon it is desired to have the first million rifles, and the intervals at which the remainder must be delivered. The full complement will not be needed until the whole army is on active service, but they must be at hand when the army takes the field. Rifles for the purpose of training will be needed as soon as the army is recruited, but the time needed to train the men can be utilized for building up the reserve supply. The army should give the industrial organization this information at the outset, so that it can plan intelligently its part of the problem.

Having received the information called for by the first three questions, we are in a position to formulate some others, which will not be so easy to answer. These are: 4—What plants are best equipped to undertake the manufacture of each of the many items of equipment called for? 5—How can they best be expanded, quickly, if there is not sufficient capacity to manufacture in the quantity needed? 6—How shall we insure to each plant the necessary supply of raw materials? 7—Where are the skilled mechanics who will operate the existing plants and the enlarged ones? 8—Are these skilled mechanics at present employed in places where their services are of the greatest advantage to the nation? If not, how can they best be transferred to the job where they will be of the most value? 9—How shall we supplement the skilled workers to make up any shortage of labor? 10—How shall we organize the various plants so that we will obtain the maximum of production? 11—Which plant in each class has the most efficient method of manufacturing? 12—How can we best transfer to the less efficient plants the methods of the most efficient? 13—What method of manufacture is best for articles that are made up of several component parts? Shall they be made up complete in the various factories, or shall the parts be made in separate factories and shipped to assembling points for assembly when and where they are needed? 14—How shall we control the inventive ability of the country so that it will act along the lines which will prove of the greatest service to the army and navy? 15—Where are the executives for the different factories to be found?

The Organization Needed

The correct answer to these questions will put the country in a state of preparedness adequate to all its needs. But it is evident that the obtaining of these answers will require a highly developed, flexible organization of wide powers and possessing impressive resources in the line of technical skill, knowledge, directing ability, and research. It is certain that such an organization does not to-day exist in the United States. We have the nucleus of it in the Council of National Defense and in the Naval Consulting Board, but these will have to be greatly expanded, reorganized and co-ordinated with other boards and committees before they can render the service that will be required. We shall discuss the ideal organization, and then consider how it can best take up the answers to the fifteen questions propounded above.

The organization in which all the authority over the preparation of munitions of war would center would correspond, in a large degree, to the present Council of National Defense. This at present consists of cabinet officers and an advisory board. It can recommend but not initiate movements for national safety. While this body is undoubtedly able to consider and advise regarding what is necessary for the safety of the country, it is not a body which will, by its constitution, give confidence that it has the ability to organize and direct the multifarious activities requisite to the equipment of an army and navy. All of the men on such a body should be chosen only for their proved ability to direct and control.

A board of industrial control composed of men of demonstrated ability in the organization and direction of large enterprises or having a reputation as specialists in one line or another of industry should be formed to take entire charge of the furnishing of munitions of war and the direction of the industries of the country for the supply of the army and navy, and if necessary, for the supply of the civilian population if the war should be of such magnitude

*Continued from THE IRON AGE, March 8, page 598.
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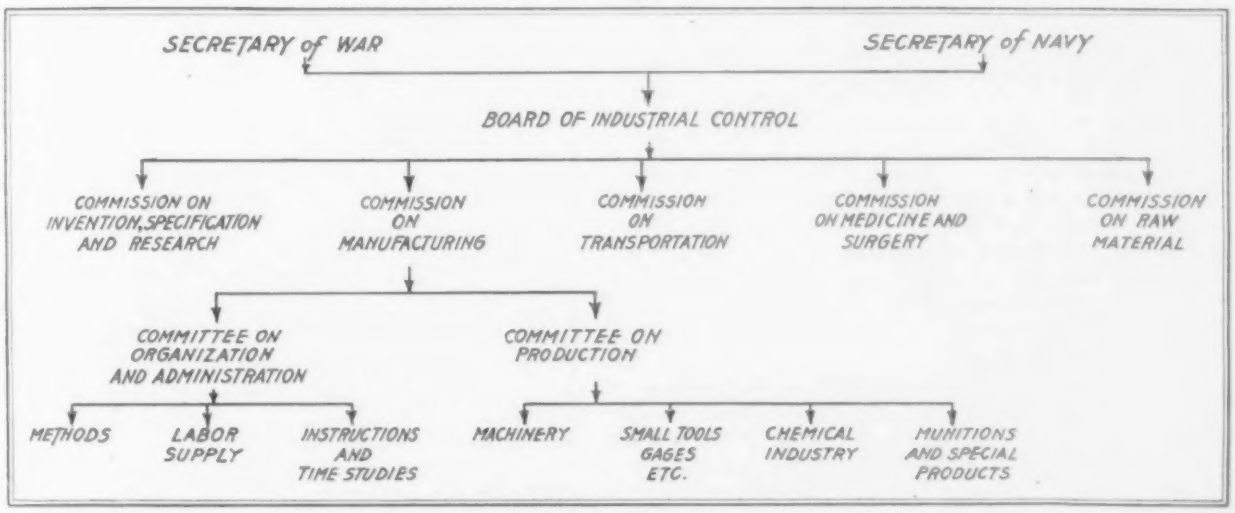
as to tax our resources relatively as much as it has taxed those of England, France and Germany. It should have the power to initiate and direct, and to requisition the services of plants, men and equipment as needed. This board would report to the Secretary of War and to the Secretary of the Navy, jointly. The reason for this is that most of the problems which would arise in supplying one branch of the service would arise in supplying the other branch and their solution by a single board would save much useless duplication of effort and conflict of standards.

Reporting to this board would be a series of subboards or commissions charged with certain general functions. In general, these commissions would be devoted to the subjects noted in the accompanying organization chart. Each of these commissions would be composed of the ablest specialists in their respective lines and they should not be limited as to numbers, but should be expanded as much as is necessary by sub-division into committees, each of which should have the personnel best fitted to cope with certain specific problems within the domain of the particular commission.



Organization Chart for the Manufacture of Munitions of War

Invention, Specification and Research

The commission of invention, specifications and research would take charge of the invention of all the new devices which would be called for by the army and the navy. This commission should include in its membership the ablest inventors and engineers that could be found and probably could be organized immediately from the Naval Consulting Board with the addition of other members to look after the needs of the army and to perform certain special duties. In addition it would be given the job of developing new methods of manufacture to meet the needs of the industrial plants as reported by the commission on manufacturing. One of its duties would be the formulation of the specifications and methods of inspection which would assure the quality of material wanted without too heavy rejections on account of slight imperfections of manufacture which would not affect the usability of the product.

Manufacturing

The commission of manufacturing would be divided into at least two sub-committees, one devoted to organization and administration of factories and the other to actual production. The function of the sub-committee on organization and administration would be to investigate the methods in use in existing plants, labor questions and the subject of transference of efficient methods from plant to plant. This committee would be charged with the duty of obtaining specific answers to questions 4, 7, 8, 9, 10 11, 12 and 13.

The committee on production would take charge of the actual manufacturing, being guided in this by the findings of the sub-committee on organization and administration. It is quite probable that it would be wise to subdivide the work of this committee into several divisions, such as the division of machine tools; small tools, which would include jigs, gages, fixtures, etc.; and into a number of divisions dealing with specific problems, such as rifle manufacture, artillery manufacture, automobiles and such grand divisions of the list of munitions as may be readily called to mind. Each of these subdivisions would include men who had specialized in the particular line of work involved and who would bring their combined knowledge of design and production methods to bear on the problem with a view to evolving the best methods and applying them in all the factories under the jurisdiction of the committee.

In all probability it also would be wise to form a committee on chemical industry, with sub-committees dealing with specific problems.

Transportation

The commission on transportation would be composed of railroad men, preferably from the operating department. Its duty would be to organize the many different railroad lines of the country and operate them as a single system. The idea to be constantly kept in mind by this commission would be that nothing must be allowed to interfere with the free flow of raw material to the munition plants and a prompt movement of finished product away from them to the distribution points of the army and navy. Everything must be subordinated to these two ends. Next in importance would be the problem of food supply and fuel to the country at large. After these problems had been met and solved, those of transportation for the ordinary industries and for passengers could be considered.

Medicine and Surgery

The commission on medicine and surgery would be organized from the foremost physicians and surgeons and its duty would be to investigate and place

at the service of the great body of physicians and surgeons called into active service the most advanced practice in the treatment of wounds and disease. This commission also would be in charge of the mobilization of the men of the medical service for the army and navy. It is quite probable that it would be wise to form a research division for this committee which would do for it what the board of invention, specifications and research would do for the manufacturing commission.

Raw Material

The commission on raw material would be in charge of the supply of all natural materials needed by the other boards, such as coal, iron ore, copper ore, timber, etc., and any other minerals which would be necessary in the manufacturing process. It, too, would be composed of men who had specialized and made their mark in these various lines. In case of a war of such severity as to require regulation of the food supply, this board might include intensive agriculture within its province in order to increase the quantity of food stuffs and also, by the addition of mechanical methods to the farms in place of labor, release a large number of men for service on the firing line or in the factories.

The Work of the General Board

Let us now consider the work which the general Board of Control and its several commissions and sub-committees will have to do. Most of the solutions will be found in the answers to the fifteen questions heretofore presented. In discussing these questions, the duties of the various commissions will appear in somewhat greater detail.

The Board will have to concern itself but little with answering the first three questions, except in those cases where military authorities seek its advice as to manufacturing possibilities. This will be done with a view to substituting for a desired item of equipment which can be produced only in limited quantities, another which can be produced in the quantities demanded.

The army and navy having stated what they need, how much they need, and when they need it, the function of the Board, through its commissions will be to ascertain immediately whether or not these needs can be met in the time specified. If the manufacturing capacity for any particular item is limited, preventing the fulfillment of the orders, the Board will immediately take the matter up and either secure a modification of the quantity, an extension of the delivery time, or it will take steps to expand the manufacturing capacity as seems most feasible.

In all cases it should cause to be reported back to the department or bureau placing an order specific information as to when deliveries will begin and the rate at which they will be kept up. It is better to promise delivery on a smaller quantity than is ordered and to keep the promise than to promise a large quantity and deliver only part of it on the date it is due. Failure to receive the equipment may disarrange highly important military plans and work serious damage to the country. In war, for instance, every department must be co-ordinated with every other department. The failure of two minor departments to co-ordinate properly their activities on a single night was responsible for the failure of the British Gallipoli campaign.

Selection of the Plants

We pass now the detail questions with which the Board would concern itself. What plants are best equipped to supply each of the items of equipment called for? This is a question which clearly would be answered by the manufacturing commission. The data for answering it are, or should be, already in the hands of the authorities at Washington in view of the industrial census taken last year under the direction of the Naval Consulting Board. The information gathered in this census should by this time be classified so that a very brief reference would show just what plants are fitted to make the different items, the capacity and the number of workmen available in each, and how promptly each plant could begin producing. The promptness with which the plant could start on an order would depend in certain lines on its supply of jigs, gages, fixtures, small tools, etc., and on its facilities for producing these necessary auxiliaries. Information regarding these points should be in the possession of the Board.

The information given by the industrial census could and should be supplemented by a corps of traveling inspectors under the jurisdiction of the division of organization and administration. These inspectors should be men well versed in the manufacture of the particular items of equipment entrusted to their judgment and familiar in all details with the requirements for rapid production. The Board, having made its decision from the data available in the industrial census as to which plants should undertake work on certain equipment, would despatch one or more inspectors to each of the plants selected with orders to confirm the report of the census and to indicate what work, if any, must be done before actual manufacturing could begin. These inspectors could probably best be recruited from the staffs of consulting industrial engineers. These are the men who are accustomed to make rapid and accurate surveys and reports thereon dealing with the very subjects concerning which the council would require information.

The selection of plants for the manufacture of each item having been completed and the size of the order to be filled by each having been decided, the plant would be turned over to the division of production with orders to produce the material within a specified time. At the same time the commission on raw material would be advised of the order and would make provision for supplying the plant with whatever it would need for the purpose of carrying it out. In supplying the raw material, the commission would co-operate with the transportation commission to insure its rapid movement and prompt delivery to the plants. There are other questions to be considered in the starting of manufacture, but these will appear and be answered shortly.

Expansion of Munitions Factories

The question as to how the plants can best be expanded quickly if there is not sufficient existing capacity to manufacture in the quantity needed is again one for the industrial engineers to answer. These men should be gathered under the jurisdiction of the manufacturing commission and specifically under the division of organization and administration. Certain industrial engineers and engineering firms have established enviable records for rapid analyses of the needs of factories and for completing the construction necessary for supplying these needs. The problem presented by the question above is simply the same one that these engineers and engineering firms have solved many times before with the possible exception of its being a larger problem than any that they have heretofore handled.

In the expansion of the munitions plants, the

division of organization and administration again will have to work hand in hand with the division of manufacturing, for the obvious reasons that expansion means not only buildings, but also machinery and other equipment. If the equipment is not available from present stocks it will have to be manufactured, and here again the industrial census will prove its value. Coincident with the extension of buildings and plants, the machinery manufacturers should be making the necessary machinery and tools. In the event of a conflict of requirements for new machinery for different groups of the manufacturing commission, due to insufficent machinery building capacity, it would be the function of the Board to decide which group should have precedence. This decision would, of course, be based upon strictly military necessities.

Recruiting the Personnel

The three questions next in order can best be answered together. Where are the engineers and skilled mechanics who will operate the existing plants and the enlarged ones? Are the skilled mechanics and engineers at present employed in those places where their services are of the greatest advantage to the nation and if not how can they best be transferred to where they will be of the most value? How shall we supplement the supply of skilled workers to make up any shortage of labor?

The first and most vital need in this connection is to find out first where the engineers and mechanics are located; second, what their experience has been; third, for what branch of work they are best fitted and in what capacity they could be of greatest service to the Government. A census should be taken of every engineer and skilled mechanic in the country.

The Board would obtain from the census the information needed to answer the last two of the three questions propounded above regarding labor. It would already have ascertained from the commission on manufacturing the number of men needed for the manufacture of the quantities of each of the items of equipment specified by the army and navy. The census would show whether there was a surplus of labor available for one group of items and a shortage of labor for another group. The details as to experience, etc., would also show whether or not it would be possible to transfer men from one line of work to another without any particular loss of efficiency, and whether it would be necessary to dilute skilled labor as has been done abroad by training women, boys and men not fitted for active service to undertake the performance of one or more simple routine jobs in munition plants. If such dilution is necessary, the skilled mechanics can probably be utilized as teachers to train these unskilled workers. If they have executive ability they will become gang bosses, foremen, etc.

The manufacturers of the country should be called upon to complete the census of workmen and mechanics, and this could be done in a few weeks with a proper system of co-operation. The digesting and indexing of the information gathered from the manufacturers would, of course, take considerably longer, but even this work could be so organized as to be rapidly carried out. One valuable feature of this census is that it is not necessary to wait until it is complete before it can be of use.

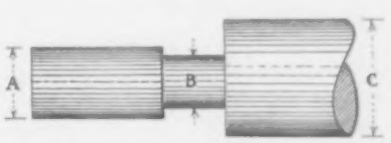
Taking the census of the engineers will be a more complicated problem. In the ultimate analysis the collecting of the information will be up to the individual engineer himself in spite of any mechanism or organization that can be formed at Washington. If the engineer is not inclined to give the information desired and to volunteer his services in case of need, there is at present no power in the country that can compel him to do so. Of course, if a universal service law is enacted, it will be easy to obtain the desired information, and the writer is heartily in favor of the enactment of such a law. Pending the enactment of such a law, however, it will be necessary to do the best that we can with the means at hand. One of the great difficulties is that we lack knowledge as to how many engineers there are in the country and where they are. The mailing lists of the national and local engineering societies will furnish the first line of attack in the gathering of this census. Private mailing lists such as are maintained by many firms, and the mailing lists of the engineering publications, would furnish other sources of information regarding the location of engineers. All these should be requisitioned by the General Board.

Organizing the Plants to Manufacture

How shall we organize the various plants so that we will obtain the maximum of production? Which plant in each class has the most efficient method of manufacturing? How can we best transfer to the less efficient plants the methods of the most efficient? These are three questions that naturally go together and which must be answered by the division of organization and administration. The division of production can by its records furnish information, supplementing the reports of the organization division's inspectors, as to which plant is turning out the maximum of product per workman or per machine. A short investigation should serve to show whether or not the high efficiency was accidental or the result of a carefully considered scheme of organization and also whether or not the organization could be improved. If this rapid survey should indicate that the plant was operating as efficiently as could reasonably be expected, then the methods used in it and the type of organization should be transferred as rapidly as possible to the other plants operating on the same product.

Methods of Manufacture

What method of manufacture is best for articles that are to be made up of several component parts? Upon the answer to this question will depend in great measure the speed with which a great amount of equipment will become available. Most of the implements of warfare to-day are assembled mechanisms. In a great many instances the assembly has no relation whatever to the manufacturing processes excepting that these latter must be accurate if the assembly is to proceed with smoothness. The assembling often can be done miles away from the factory where the parts are made and perhaps done better than at the factory.



If dimension *B* does not have to fit anything, it is foolish to require it to be made to the same limits of error as dimensions *A* and *C*

It is quite probable that in the manufacture of munitions of war, we can take a leaf from the book of the automobile manufacturer. For example: A field gun consists of a number of different parts, the manufacture of which have no particular relation to one another. Thus there is the gun itself, the recoil slide, the axle, the wheels, the stock and a number of other minor parts. The question comes

up for decision as to whether all these parts shall be made in the one factory or made in separate factories especially adapted to the manufacture of that one part and then shipped to assembly centers designated by the army and navy for assembly and use. If this course is followed, it will necessitate much closer manufacturing than will be required if all of the parts are made in the same factory and fitted together. It will necessitate a larger supply of jigs, gages and fixtures, but it will also make for speed in manufacturing after this preliminary equipment has been provided. The question, while only a question of policy, is nevertheless one which will have great influence on the speed of manufacture and quality of product and which should therefore receive careful consideration.

Control of Inventions

How shall we control the inventive ability of the country? Primarily through the commission of investigation, specification and research. The Naval Consulting Board is the foundation upon which this commission should be built. It already includes in its membership men of proven ability in the solution of different problems, it is organized and has done some of the necessary preliminary work.

Specifications and Inspection

Not the least important duty of this commission will be the making of specifications for all items of equipment called for and also development of methods of inspection to see that these specifications are carried out. The specifications should be exceedingly liberal in regard to non-essential details and correspondingly rigid on essentials. Methods of inspection should be similarly rigid and lax for essentials and non-essentials respectively. The value of this combination of laxness and rigidity has been shown in the manufacture of munitions for the Entente Allies, wherein insistence on extreme accuracy in non-essentials has resulted in the rejection of thousands of dollars' worth of equipment. For instance: The accompanying sketch shows a piece forming part of a mechanism manufactured in large quantities for the English Government. The dimensions *A* and *C* were required to be accurate to 0.001 in. The connecting piece had no function except to tie the other parts together. It was not required to fit anything and a variation of 1/16 in. in its diameter would have made no difference. Nevertheless, thousands of these pieces were rejected by the inspectors because the dimension *B* did not conform to the dimension given on the drawings within the limits of accuracy called for by dimensions *A* and *C*.

Finding the Executives

Where are the executives for the different factories to be found? The proposed census of engineers will show what men in the country are accustomed to the management of men, in doors and out. It will show their experience along the particular lines for which executives are needed and their selection will be a matter of comparative simplicity, once the information is available as to who and where the men are.

Work Should Begin Now

The above general plan is offered not with the idea that it is the best plan or the only plan for the organization of the industries of the country for purposes of war. It is offered simply as representing ideas of one man with the hope that it will be taken up, discussed and improved until the proper co-ordination is effected among all the industries of the nation. It is realized that an organization such as has been proposed will require new and radical legislation. The Board of Industrial Control should have arbitrary, not to say dictatorial powers, powers which we would not dream of giving to any man or group of men in ordinary times. But we are living in an extraordinary time and this demands extraordinary measures. The start has already been made in obtaining needed information regarding our industries. Let us at once start to obtain the information about, and organize the men who would be required to run these industries. Let the start be made now.

Judicial Decisions

ABSTRACTED BY A. L. STREET

POINTS IN EMPLOYEES' PERSONAL INJURY SUITS.—It appearing that belt shifters are not, and cannot practicably be, used on cone pulleys, an employer's liability for injury to a workman cannot be predicated upon the former's failure to provide a belt shifter for use in shifting a belt from a large cone pulley to a small one. In a personal injury suit, the jury is not entitled to award damages for prospective loss of earnings by the injured plaintiff where the extent to which his future earning power is impaired is purely conjectural. (United States Circuit Court of Appeals, Fifth Circuit, United States Cast Iron Pipe & Foundry Company vs. Eastham, 237 Federal Reporter, 185.)

LOSS OF ORE IN LIGHTERING—The owner of a scow, chartered for the purpose of lightering a cargo of ore from a vessel and which sank while being loaded, is liable for the loss, it appearing that there was no overloading, that the cargo was properly trimmed, and that the scow was unseaworthy because of a leak. The charterer was entitled to assume that the scow was in seaworthy condition, in the absence of information to the contrary, and was not at fault in failing to provide a pump. (United States District Court, District of Maryland, Naylor & Co. vs. Terminal Shipping Company, 237 Federal Reporter, 725.)

PRIOR USE OF PATENTED DEVICES—To supersede a patent, prior use of the invention must have been public, and not merely private. Where machines were shown to customers and were familiar to employees using them, their use was public, although they were kept secret from competitors. The sale of the product of a machine which is still being experimented with and improved, and the use of which is kept secret, does not take the machine out of the experimental stage, so as to constitute a public use, and invalidate a subsequent patent for the completed machine. (United States District Court, Western District of New York, Mayer vs. Mutschler, 237 Federal Reporter, 654.)

LEGAL ASPECTS OF MACHINERY SALES—A contract for sale of a weigh pan to be used at a mine implied an undertaking on the part of the seller to furnish one reasonably well adapted to the intended use, and the buyer was not bound to accept delivery of an unsuitable one. Where separate articles are bought at the same time for use in conjunction with each other (in this case, a weigh pan and scales for use in a coal mine), if one article fails to come up to the contract requirements the entire delivery may be rejected, although one or more of the articles come up to the agreement. (Oklahoma Supreme Court, United Iron Works Company vs. Henryetta Coal & Mining Company, 162 Pacific Reporter, 209.)

VALIDITY OF MANUFACTURER'S CONTRACT—A manufacturer's agreement to supply certain products to a dealer for sale on commission as ordered by the latter during a stated term, the dealer agreeing to order a stated minimum quantity each year under penalty of cancellation of the contract, is not invalid as being one-sided. When the language and circumstances surrounding a contract of sale indicate that the parties mutually intended that time for performance of the contract, as specified in the agreed terms, should be a material consideration, failure to live up to the provision will justify the other party in cancelling the contract. (United States Circuit Court of Appeals, Eighth Circuit, Meier

Dental Mfg. Company vs. Smith, 237 Federal Reporter, 563.)

INJURY THROUGH STARTING MACHINERY.—In an action for injuries sustained by a blacksmith in a manufacturing establishment through sudden starting of a machine by the operator while the blacksmith was making changes in the gear of the machine, at a point not visible to the operator, it is held that the two employees could not be regarded as fellow servants within the legal principle that an employer is not liable for injury to one employee caused by negligence of a fellow servant in the same line of work. The employer is liable for negligence of the foreman of the machine in failing to provide suitable safeguard against starting of the machine by the operator, who did not know of the blacksmith's presence; the foreman being in a position to appreciate the danger of failing to take precaution against sudden starting of the machine. (St. Louis Court of Appeals, Dittrich vs. American Mfg. Company, 190 Southwestern Reporter, 1006.)

A STRUCTURAL IRON SALES CONTRACT.—In a suit in which the right of plaintiff to recover damages for breach of defendants' contract to buy structural iron is upheld, the Maine Supreme Judicial Court holds that the fact that the buyers, in accepting the seller's offer, requested that part of the material be rushed did not constitute imposition of such new term of sale as to require acceptance of that condition by the seller before a binding contract of sale could exist. Nor was the contract invalid because silent as to time and manner of payment; the law presuming, in such circumstances, that it was mutually intended that payment should be made on delivery. The fact that plaintiff seller requested that defendants furnish credit rating, after the contract was entered into, did not justify defendants in rescinding the contract; it not appearing that plaintiff sought to impose giving of security as a new condition to delivery. Defendants' reply to this request, naming a reference and stating that defendants did not ask for credit and that the plaintiff had better cancel the order, authorized plaintiff to cancel, but did not of itself rescind the contract. The damages recoverable by plaintiff are to be measured by the profits lost through defendants' refusal to carry out their contract of purchase, and include any loss sustained through contracting with a third person to furnish iron on the strength of the broken contract. (Simpson vs. Emmons, 99 Atlantic Reporter, 658.)

TRADEMARK RIGHTS.—Priority of use of a trademark is the principal element upon which its ownership depends. The prior use need not be large or extensive or of long duration. (United States District Court, Southern District of New York, Waldes vs. International Manufacturers' Agency, 237 Federal Reporter, 502.)

New Line of Heavy-Duty Quick Change Lathes

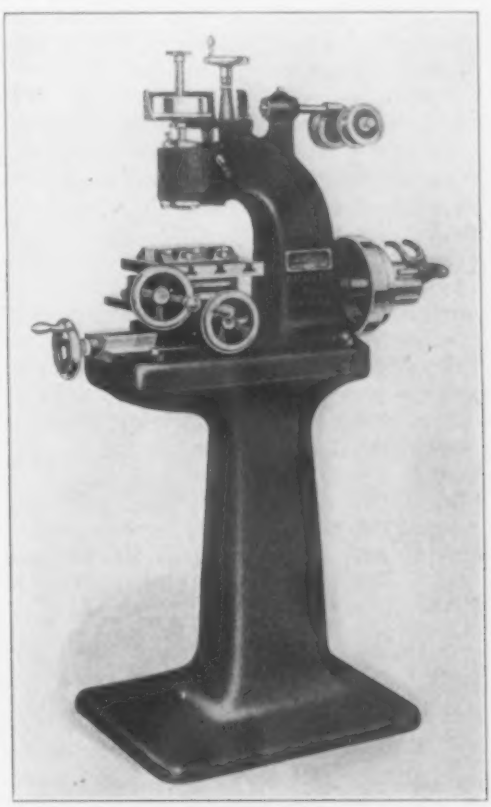
The Axelson Machine Company, Los Angeles, is building a line of heavy-duty, quick change gear lathes. They are built in 16 and 18 in. sizes with a three-step cone pulley and double back gears, although a four-step cone pulley and single back gear type can be supplied if desired. The standard length of bed is 6 ft. but other lengths up to 12 ft. can be furnished. The tools are of standard heavy construction with a headstock and bed that are reinforced by ribbing.

The double-plate type of apron is used equipped with a non-interfering device to prevent simultaneous engagement of the feed rod and lead screw and reverse for the friction cross and traverse feeds with which the lathe is provided. An automatic stop capable of adjustment on the feed rod is provided to check the motion of the carriage when feeding toward the headstock. Only two levers are required to secure the 32 available threads, ranging from 3 to 46 per in., from the gearbox. These changes can be made while the lathe is running, and an auxiliary quadrant enables extra change gears to be employed for cutting threads that cannot be secured through the quick change mechanism provided. Spindle speeds to the number of 18 and ranging from 12 to 349 r.p.m. are provided for the 18-in. machine, while the smaller lathe has 16 speeds ranging for 6.67 to 420 r.p.m.

Vertical Milling and Profiling Machine

The Bickett Machine & Mfg. Company, Cincinnati, has put on the market a vertical milling and profiling machine with a number of special features. The chief point of difference from the standard machines of this kind is in eliminating the adjustable knee, provision being made for the adjustment entirely in the spindle head. This arrangement provides for a rigid table, thereby, it is explained, reducing the possibility of vibration to a minimum and affording a true alignment at all times.

The machine is made to run safely at a comparatively very high speed, and the manufacturer claims it will operate continuously at 2500 r.p.m. The spindle is made of crucible steel, mounted on high-grade radial-thrust bearings. The spindle pulley is 1¼ in. wide and 4 in. in diameter. It is flanged on the lower side and provided with a belt guard. The intermediate pulleys are flanged on both sides. The rotary table is 7 x 10 in., and has three ½-in. T-slots. It is rotated by an Acme thread screw, that is fitted to a large worm which can be engaged or disengaged very easily.



The Adjustable Knee Has Been Eliminated in This Vertical Profiling and Milling Machine, All Adjustments Being Made in the Spindle Head

The longitudinal feed capacity of the machine is 6 in.; transverse feed, 5 in. and vertical feed, 2 in. The total height of the machine, without pedestal, is 26 in.; width of base, 11 in.; length of base, 20 in.; distance from top of rotary table to spindle nose, 4¼ in. The weight of the machine complete is 200 lb. Full equipment, such as a toolmaker's vise, Hardinge collet, draw-in attachment and the necessary wrenches are furnished.

If desired the machine can be furnished with a lever feed attachment, in place of the elevating screw, which makes it handy where rapid vertical adjustment is required.

The National Board of Fire Underwriters calls attention to the numerous fires caused by leaving small electric devices in circuit when not in use. The Actuarial Bureau of the National Board reports that in one day 100 fires out of a total of 2000 were traced to this cause, and it is estimated that fully 30,000 fires a year have such an origin.

Determining Efficiency of Gas-Fired Boilers

Given the Boiler Evaporation and the Consumption of Blast-Furnace Gas, the Result Is Obtained Graphically

THE accompanying charts have been prepared by H. A. Reichenbach, steam engineer, South Bethlehem, Pa., to determine graphically the efficiency of a boiler fired by blast-furnace gas. They have been found useful in a plant having a large number of gas-fired boilers and employing an efficiency corps of young men capable of taking field data in a boiler test but not of making the calculations for determining the efficiencies. The use of the curves, according to Mr. Reichenbach, have given results within 1 per cent of those obtained by calculated results.

Chart 1 is a graph of factors of evaporation. The test data supply the total evaporation and the pressure under which this evaporation occurred together with the feed water temperature and from these, of course, is obtained the factor of evaporation.

Chart 2 is used to determine the volume of the gas under so-called standard conditions corresponding with the volume under observed conditions. The test data give the number of cubic feet per hour, for example, supplied to the boiler and the temperature of the gas as supplied as well as the pressure. The chart provides for determining the corresponding volume at 32 deg. Fahr. and 30 in. of mercury pressure.

Chart 3 provides for determining the amount of heat represented by the evaporation and also the amount of heat represented by the combustion of the gas. The ratio of the one to the other is a measure of the boiler efficiency. The heat absorbed by the boiler has a straight line relation to the total equivalent evaporation, as indicated by the location of point *N* in Chart 3. To ascertain the heat supplied by the gas it is necessary to obtain the calorific value of the gas such as is represented by the number of British thermal units per cubic foot. This in this calculation is based on the carbon monoxide and the hydrogen content of the gas. For the point *J*, corresponding to the CO percentage, is located the point *K* according to the simultaneous percentage of hydrogen. The point *K* determines the calorific value of the gas. The point *L* is located to secure the product of the unit calorific value of the gas by the total volume under standard conditions as ascertained by Chart 2. The point *O* expresses the efficiency of the boiler inasmuch as the abscissæ and ordinates of this portion of Chart 3 are both measures of millions of British thermal units.

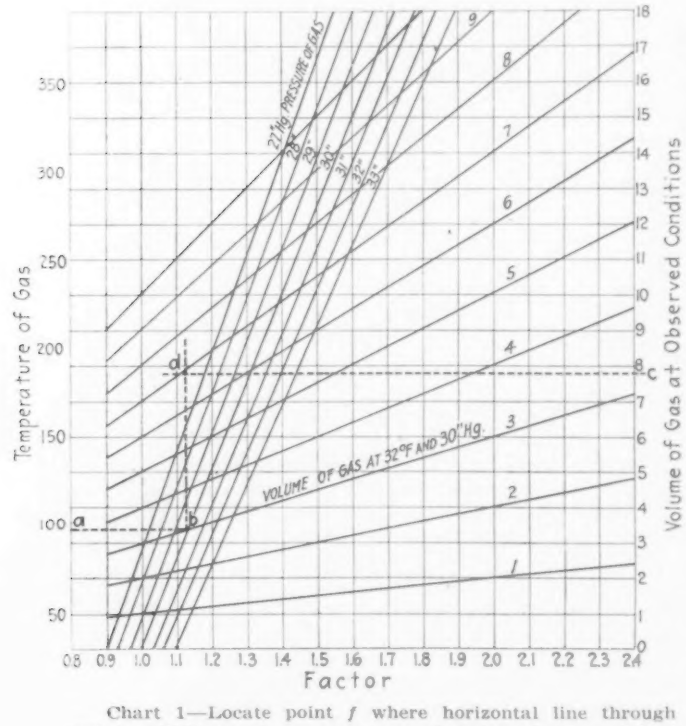


Chart 1—Locate point *f* where horizontal line through point *e* (126) on steam pressure scale intersects line of feed water temperature (169). Pass line vertically until it intersects line corresponding to number of pounds of water evaporated at observed conditions or point *g* (45,976). Draw line *g-h* horizontally to intersect scale showing equivalent number of pounds of water evaporated from and at 212 deg. Fahr. The equivalent evaporation is thus close to 50,000 lb. per hr.

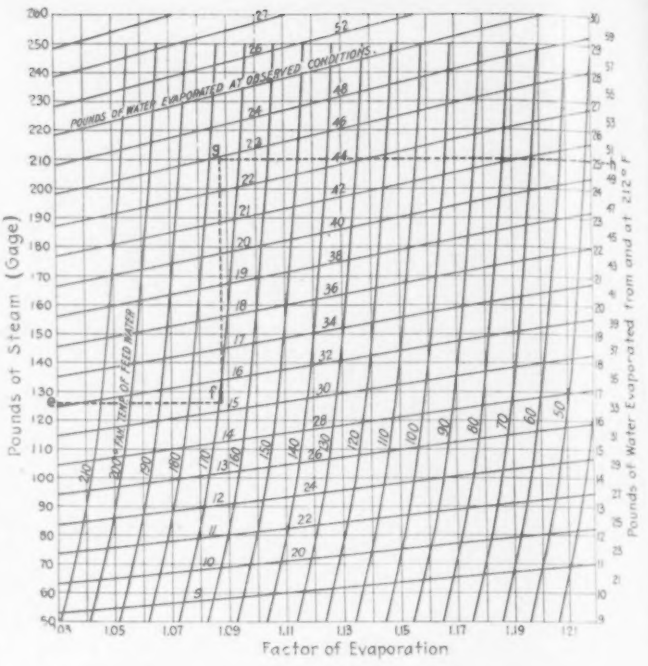


Chart 2—Locate point *b* where horizontal line drawn from *a* on the scale of temperature of gas (98) intersects line of total pressure of gas (29.77 in. mercury + 0.7 in. water). Draw horizontal line from point *c* in scale of volume of gas at observed condition (777,800) and locate point *d* where latter horizontal line intersects vertical line drawn through point *b*. Point *d* referred to slant lines locates graphically the corresponding volume of gas at 32 deg. Fahr. and 30 in. of mercury pressure, or close to 690,000 cu. ft.

The charts show the working out of results for the following observed data:

Test Data Observed

Water evaporated per hour at observed conditions, lb.	45,976
Steam pressure (gage), lb.	126
Temperature of feed water as fed to boiler, deg. Fahr.	169
Gas per hour to boiler, cu. ft.	777,800
Temperature of gas as fed to boiler, deg. Fahr.	98
Pressure of gas in main, in. water gage	0.7
Hydrogen in gas, per cent	23
Carbon monoxide in gas, per cent	31.8
Barometer, in. mercury	29.77

The great Hell Gate Bridge, extending over the East River, between the Borough of the Bronx, New York City, and Long Island, was dedicated to the service of the public March 9 by Samuel Rea, president Pennsylvania Railroad, and a party of directors and officers of that road and the New York, New Haven & Hartford Railroad, by which the Connecting Railroad and the Hell Gate Bridge were jointly constructed. The dedicatory ceremonies were part of an inspection trip. It is the connecting link in an all-rail route from New England to the South and West, to be in regular use in a short time.

PLANT DEPRECIATION

A Comparison of the Four Methods of Calculating the Allowance

Methods of estimating depreciation were discussed editorially in *Engineering* of London, Jan. 19, and the following notes, condensed from the discussion, will be of interest particularly to manufacturers of munitions:

When machinery is run regularly for a greater number of hours per week than normal, the percentage fairly chargeable to depreciation is greatly increased. In munition factories in Great Britain the normal 48 or 52-hr. week has become in certain cases 168 hr. and in most cases 130 to 140 hr. This means multiplying the ordinary depreciation factor by 2½ to 3¼. But this is of relatively small importance compared with the depreciation that a machine suffers due to the abuse it receives under the intense pressure of munition production, and a 5 to 7 per cent depreciation factor may fairly become 30 or 40.

There are still divergent ideas as to the way depreciation should be charged. But of late years legislation has stipulated that public utilities shall be subject to pre-emption after a certain number of years at a price representing the value of the plant. It is by no means easy to fix the value of a machine for which there are no competing buyers. Valuers, to defend estimates, usually fall back upon some system of making deductions for depreciation based upon an assumed length of life.

Methods of Charging Depreciation

There are four recognized methods of charging depreciation: 1. The reducing-balance method; 2, the straight-line method; 3, the annuity method; 4, the sinking-fund method. Each system may be exemplified by its application to a hypothetical machine costing $500 and having a physical life of 25 years, with a scrap value of $10 and an economic life of 19 years, with a scrap value of $65. It is assumed that the $500 should provide $25 annually for the stockholders and that enough should be written off to provide $435 at the end of 19 years.

The Reducing Balance Method

In the first method a fixed percentage is charged each year against the last year's value. The value of the machine shrinks, while the sum in the depreciation fund increases by a like amount. There is always $500 made up of machine value and money in the fund to earn the $25 dividend, and at the end of 19 years the machine is worth $65 and the fund $435. The interest of the fund is paid to the stockholder and is not credited to the fund. Further, the value of the machine falls very rapidly at first and very slowly toward the end, the curve getting gradually flatter.

Now this does not agree with the facts. A machine, properly cared for, suffers no damage during the first three or four years. A steam engine may actually increase in efficiency in that time. Some kind of plant runs efficiently to the last and then collapses. A telephone pole will carry its wires with uniform efficiency until it is blown down or condemned by the inspector, and an underground conduit suffers little decay, if any. On the other hand, a machine goes from bad to worse very fast toward the end, and its earning capacity may decrease even faster, quite apart from obsolescence. The praiseworthy feature of the reducing-balance system, when applied to machine tools, is that it provides that the earning power of moving plant suffers a steady diminution. It even emphasizes this more at the beginning, but that is just the time when the machine can earn big profits, and it is sound policy to take advantage of this capacity, even if it be not scientific book-keeping. In a plant that does not deteriorate gradually, but all at once, the value fixed by the first method is remote from the facts.

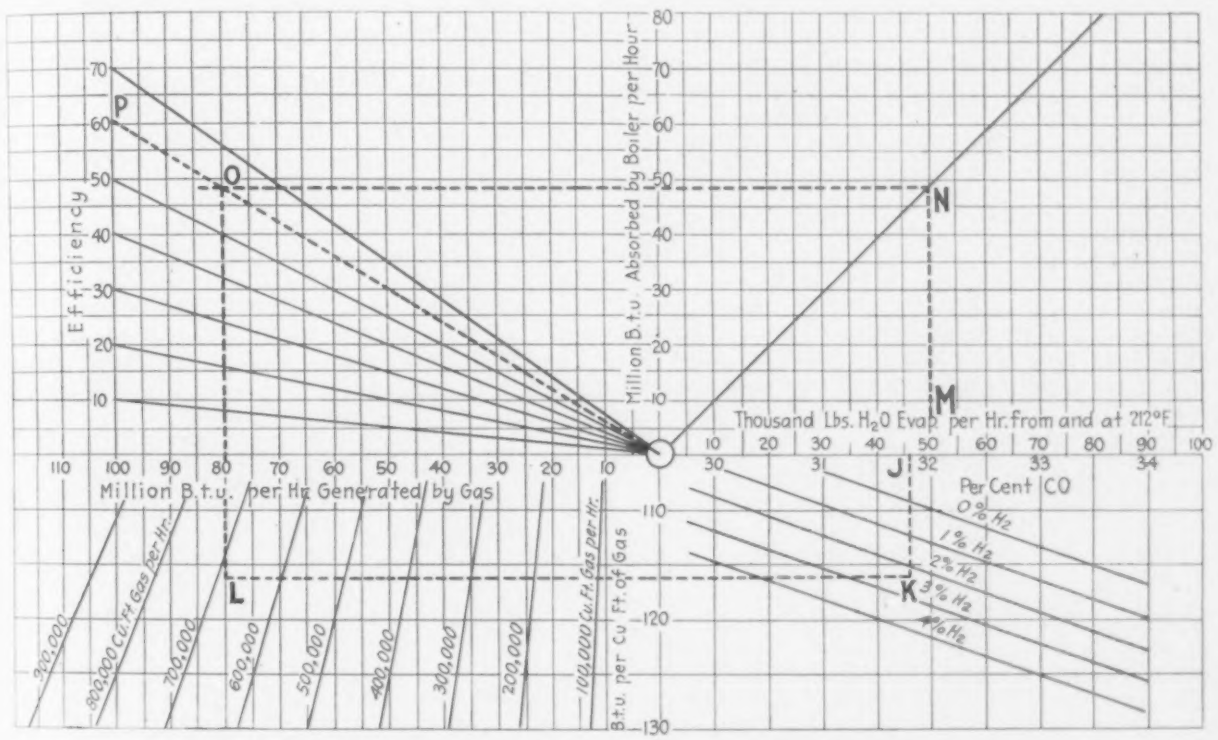


Chart 3—From point M corresponding to the water evaporated from and at 212 deg. Fahr. determined from Chart 1, or about 50,000, draw vertical line to intersect slant line at point N.

Locate point K corresponding to percentage of carbon monoxide (31.8 per cent) and hydrogen (2.3 per cent) in the fuel gas and draw horizontal line K to point L corresponding to the volume of gas per hour to the boiler as determined from Chart 2, or about 690,000.

Draw horizontal line from N and vertical line from I, and locate point of intersection O. From zero point of chart draw line through point O until it intersects efficiency line at point P. The location of this point will indicate directly the efficiency of the boiler.

The Straight-Line Method

With the straight-line method, under the hypothetical conditions, $25 is required annually for interest and $7.90 for depreciation fund, the latter totaling

$435.10 in 19 years, without interest. The $25 goes to the stockholder and the $7.90 is invested either in a special fund or in the business. The interest of the fund, however, goes into the general account. The machine is supposed to earn its $25 a year all its life, and the dividend is swelled by interest from the depreciation fund. If the interest be added to the depreciation fund year by year, then a depreciation of 2.85 per cent would be sufficient to furnish $435 in 19 years. In the case of plant like the telephone pole it is clear that by the straight-line method the dividends are being reduced in the early years and augmented in the later years, while the profits are uniform. Clearly this is not good book-keeping. In the case of machine tools the interest from the depreciation fund is available to supplement the reduced earning capacity of the tools, and the only difference between the first system and the second is that in the second the reduction of value is assumed to be uniform and not decreasing. Both systems look to the interest of the depreciation fund to supplement the decreased earning capacity of the plant.

The Annuity

The third system is the annuity method, by which each year a part of the capital is repaid, and a return is paid on the capital outstanding. The total annual charge is uniform at $39.25 for interest and depreciation and is made up of a decreasing return component and an increasing depreciation component. In the course of the 19 years the amount available for depreciation rises from $14.25 to $34.30. The capital value is diminished each year by the amount of the depreciation, and consequently the amount required for interest becomes less and less. At the same time the interest earned by the depreciation fund is paid into the general account, so that the stockholder still gets his $25, partly by earning from the depreciated machine and partly from the fund. By this plan the plant is written down slowly at first and more quickly toward the last, which corresponds with the condition of moving machinery.

The Sinking Fund

The fourth method is the sinking fund. The total annual charge is $39.25, made up of uniform charges each year, both for interest and depreciation. The interest earned by the fund is added to it annually, while the value of the plant is not diminished but is credited with earning 5 per cent throughout the period. This is exactly the case of the telephone pole. It will be observed that the amount set aside in methods 3 and 4 is identical, and the result is identical at the end of 19 years. The difference is that in one case the value of the plant is supposed to decrease annually and in the other it remains constant. The difference is one of book-keeping mainly.

Method 3 has advantages over 1 and 2, from the point of view of the man who is liable to be pre-empted, for it does not oblige him to admit that his plant ages faster than the years go by, or even as fast. It involves, however, the assumption, as do methods 1 and 4, that 5 per cent can be earned by the depreciation fund, either in the business or outside it, for 19 years. If there were any falling-off in this respect the consequence would be serious, as it is in the latter years that the compound interest mounts up. The manufacturer who adopts method 1 and accumulates money fast in the early years is in the safer position, while the one following the straight-line method 2 is not dependent on the interest of the fund to square his accounts.

Obsolescence

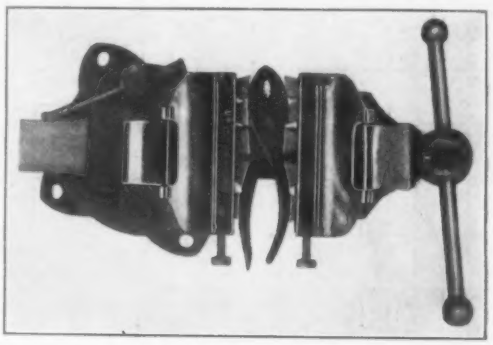
Obsolescence is entirely a different matter from depreciation. If it be conceded that it is possible to foretell the life of a plant, then depreciation is merely a matter of book-keeping. But obsolescence is a risk, and, like all other risks, must be covered by insurance. The invention of a new machine or process—by someone else—may be as disastrous as a fire, and is far more likely to occur. Many risks, such as fire, shipwreck and sickness may be estimated, but we have no certain figures about obsolescence. The risk grows greater every year, and therefore the necessity of insuring against it. Each manufacturer must create a fund for himself and decide what the premium shall be. It is well to err on the safe side, for even if there be no striking invention the trend is toward more elaborate and more expensive machines. Our hypothetical $500 may be forthcoming at the end of 19 years, but it may be found that the new machine costs $1,000. It is legitimate to raise new capital for the purpose, but it is not always easy.

Methods of providing for depreciation and obsolescence depending upon the growing power of compound interest do not concern munitions makers just now. If the life of a machine be estimated at two years, any one of the four methods detailed above is as good as another. The point of critical interest is whether the life will be 18 months, two years or three years. A mistake in this respect will be of far greater importance than the selection of a straight-line diagram in place of a curved one.

A Special Attachment for Vise Jaws

The Universal Equalizer Company, Cincinnati, has placed on the market a new vise jaw attachment, which the manufacturer claims embodies an entirely new application of a mechanical principle. It is made in different sizes to fit all standard vises, and by its use any shaped piece such as ovals, rounds, etc., may be firmly held.

The mechanical principle can be likened to a number of round balls resting in a row, slightly off center. When pressure is applied to the end balls, all of the



Irregularly Shaped Pieces of All Kinds Can Be Held in an Ordinary Straight Jawed Vise by the Use of a New Vise Jaw Attachment

others will move out of line in opposite directions. Thus by arranging a number of lugs, as shown, in opposite directions, with curved contacts in a channel, these lugs will act as compensating wedges and force the gripping lugs to protrude from the channel and automatically equalize any pressure which may be applied. In other words, the result is obtained simply by causing two or more lugs or wedges to co-act, thus applying an equal pressure on the surface of any shaped piece.

The device is made of cold rolled tempered steel, and after manufacture is heavily nickeled. The manufacturer claims that it will save a great deal of time in shops where uneven shaped pieces have to be placed in a vise for filing or any other finishing operation.

The Titanic Mfg. & Machine Company, Cleveland, has been incorporated with a capital stock of $10,000 which will be increased to $100,000, to manufacture steel castings under a process invented by A. H. Davies, manager and superintendent. A chemical compound, the composition of which is a secret, is placed in the molten metal, and is claimed to make the castings free from blowholes and hard spots, to prevent shrinkage and further to make a metal that can be used for tool steel. The company plans to erect a foundry equipped with a 10-ton open-hearth furnace. R. B. Oliver is president; H. Benens, vice-president, and R. Forsyth, secretary and treasurer. The company's offices are at 819 Guardian Building, Cleveland.

Dental Work in Industry

In a paper on dental work in industry, by Lee K. Frankel, Metropolitan Life Insurance Company, New York, appearing in the February issue of the *Efficiency Society Journal*, a compilation is made of the degree of attention being given the teeth of employees of various companies throughout the United States. In answer to a questionnaire, data were obtained from 27 establishments.

It was found that some industries are conducting dental work at the company's expense and during work hours, others on the company's time but at the employees' expense. Some employers provide the service for children of employees; a few firms require the examination of teeth on entrance to the business. Cleansing, examination and filling are included in free service in some cases, while in others cleansing and examination only or merely examination and advice. Where dental work is already installed it is considered one of the most important phases of the welfare department.

The report of the B. F. Goodrich Company, Akron, Ohio, shows that in 1915, 21,606 employees were examined. Free examination is in effect in this plant, but brushes and tooth powder are supplied at cost. The Colorado Fuel & Iron Company is planning, in addition to hospital treatment, the extension of dental hygiene to the mining camps. The Tennessee Coal, Iron & Railroad Company provides examination of the teeth of employees' children at the beginning of the school term and presents each with a tooth brush and aluminum cup. The Norton Company, Worcester, Mass., requires an examination of teeth on employment.

Mr. Frankel describes the working of his company's clinic. Between Jan. 1 and June 30, 1916, 2843 patients were treated at a cost of $7,229, or an average of $3 per hr. and $2.23 per patient. In closing Mr. Frankel speaks of the cost of the service as follows: "We have felt it was insufficient to give employees average care. If the results were to be of value, it was required that the prophylactic treatment given should be among the best obtainable. To this end we have secured the services of competent men and installed the best equipment. It is our impression that in time this expenditure will justify itself. There is already a considerable demand on the part of employees that the service be extended to include fillings, etc. It is quite likely that this may be done, if a satisfactory adjustment of cost to the employee can be arranged."

Heating of Rivets by Gas and Oil Compared

A test recently made by the Newport News Shipbuilding & Dry Dock Company to check the cost of operating a rivet heating furnace by gas as against the oil furnace formerly employed showed that more time was required by the gas furnace and the fuel cost was also increased. The results, it is understood, showed that 400 lb. of rivets were heated in the oil furnace in 44 min. at a cost of 52.5c., assuming that oil cost 6c. per gal., while the cost of heating a similar quantity of rivets in a gas furnace with gas at 55c. was 53.6c. and the time required was 57 min. It is stated, however, that the rivets heated in the gas furnace were better than those heated in the oil furnace, as there was practically no scale upon them, while those heated by oil were badly scaled in a number of cases. The gas-heated rivets are said to stay hot enough to drive longer than those heated in an oil-fired furnace, because the former are thought to be heated evenly all the way through, while the oil-heated rivets are extremely hot on the outside but are not hot in the center and thus cool more quickly.

Planning-Room Functions is the title of a paper to be presented by F. E. Cooper at a joint meeting of the efficiency and scientific management section of the Providence Engineering Society and the local section of the American Society of Mechanical Engineers to be held at Providence, March 26. The paper will cover the path of an order from its receipt until the workman starts work on it in the shop, the bill of material, routing, scheduling, central control by a bulletin board and the use of a tickler.

Rivet and Bolt Head Cutter

The Rivet Cutting Gun Company, 220 East Second Street, Cincinnati, after exhaustive tests has put on the market a pneumatic tool for cutting off the heads of rivets and bolts, and which is also intended to back the rivets out. The manufacturer claims that about

This Pneumatic Tool for Cutting Off the Heads of Bolts and Rivets Is Designed as a Substitute for a Cutting Bar and a Sledge, the Use of a Long Bar also Eliminating Scaffolding in a Number of Cases

75 per cent in cost is saved over the hand method of using a cutting bar and sledge. It is also claimed that by the use of a long cutting tool, rivets and bolts can be reached that are located where a scaffold would be required when employing the ordinary hand method.

The machine as illustrated is operated by three men where heavy and quick work is required and is so simply constructed that repairs are said to be reduced to a minimum. It consists of an elongated cylinder in which there is a piston mounted on slides. At the lower end of the cylinder a cup-shaped casting is provided that carries the cutting tool. The shank of the tool is passed through the casting and projects into the lower end of the cylinder. It is fitted into a toolholder between which and the end of the cylinder is a spiral spring to absorb any abnormal shocks, or in other words, to take the impact of the piston in the event that the tool shank slips out of its holder.

At the bottom of the cylinder is an exhaust port connecting with a pipe that leads back to the valve chamber at the top of the machine. This pipe serves also as one of the handles for the operators. By using a three-way valve the operator can reverse the pressure and force the piston back to the head of the cylinder where another exhaust port is provided. A quick turn of the valve again forces the piston forward.

The machine weighs approximately 85 lb. and operates successfully on air pressure of from 45 to 125 lb. It is also used for punching holes in plates preparatory to reaming them to the correct size. The manufacturer also claims that it is especially valuable in structural steel work and can be used advantageously in awkward places where the ordinary maul and chisel would be handled with great difficulty.

Manchuria is to have a new blast-furnace plant built by the South Manchuria Railway Company. It is reported that it is to be operated in connection with an iron mine located in the An Shan Chan region. The output the first year is estimated at 150,000 tons. An abundant supply of lime is said to be available nearby and most of the coke will come from the Fushun mines, owned by the railroad. Erection is expected to commence in April.

Naval Service for Mechanical Engineers

What Need There Is in Navy Yards in Time of War and How Applicants May Register with the Navy Department

BY FREDERIC G. COBURN*

WHILE opportunities for civil and electrical engineers for effective service with the military forces are apparent, they are not so for mechanical engineers. Yet there is such opportunity for mechanical engineers, and for marine and industrial engineers as well, in the manufacturing arsenals and navy yards. It is the present object to show what this opportunity is, and how those who desire to take advantage thereof should go about doing so.

There exists, in certain uninformed quarters, an idea that a navy yard consists of a park with a number of piers to which battleships and other naval vessels may be secured while the crews take their vacations. This is, indeed, far from being a fact. The navy yards are quite sizable industrial establishments, with large forces of civilian employees, in a great variety of mechanical trades. Some of the yards are large, employing over 5000 hands; and some, of course, are quite small; but there are half a dozen or more that employ more than a thousand hands.

In peace-time the function of the navy yard is to make repairs and alterations to naval vessels, to manufacture such equipage as cannot, for various reasons, be purchased, and to build new ships; as may be found necessary.

Why Large Navy Plants Have Been Needed

To the uninformed, it is not, perhaps, apparent why such large plants should be required for repairs to ships; but this arises out of the lack of understanding of the causes of these repairs. There is no inconsiderable amount of repairs required on account of plain corrosion and wear and tear of the structural parts of the ships. The lower parts of bulkheads in inaccessible locations will corrode clear through. A tiled deck will be corroded through on account of an unnoticeable leak in the tiling. Wooden decks will wear down until the heads of the deck bolts show themselves. Pumping and drainage systems require renewal due to corrosion. The effect of target practice is always to necessitate certain repairs.

And then, of course, the navy has its share of marine casualties. Occasionally a ship will ground and may require a new bottom. Ships may be in collisions and require extensive structural repairs above and perhaps below the waterline. Heavy storms always leave a wake of damage which frequently require a visit to a navy yard.

Structural alterations are constantly being made to improve the sea-going or military characteristics of the vessels, with a view to keeping pace with progress as much as is practicable. The introduction of the cage masts on the older vessels is an example of this kind of alteration. Changes in ammunition hoists, in fire control systems, are not infrequently made; and many of these alterations are very extensive.

There is a large amount of equipage manufactured in the navy yards, such as anchor chains, cordage, small bolts, blocks and cooperage, fenders and riggers' supplies, electrical gear, bearing metal, engine, pump and boiler fittings, furniture, etc. There is a great variety of this equipage which cannot well be purchased and which the government must manufacture for itself.

The machinery repairs and alteration are quite as extensive as those to the structural parts of the ship itself. The big jobs, of course, are renewal of boilers, re-boring cylinders, provision of new pistons and lining up main engines, renewal of pumping and drainage systems, etc.; and there is an enormous amount of minor repair work, such as pump repairs, electric generators, etc.

To do this work a group of shops is required. There are, of course, a pattern shop, foundry, forge shop and machine shop; and in practically all of the yards the foundry produces both iron and brass, and in some of them steel as well. An electric shop does the work on electric generating and transmitting equipment, searchlights, radio installations, etc. There is a joiner or carpenter shop; a complete outfit of shipbuilding shops, such as plate and angle shops, mold loft, building slip, etc.; a sheet metal shop; a boiler shop; a rigging loft; a sail loft; and at the Boston Navy Yard a cordage factory and a chain factory. These shops employ the same trades as would be found in similar shops in any shipyard or railroad shop.

How the Industrial Plant Is Operated

This industrial plant is established within a military plant; but the form of organization is such as to separate the military and industrial parts. The industrial establishment may or may not be divided into two or more departments. Under the so-called Meyer system of organization, the industrial or manufacturing department is divided into two main parts; but in the form of organization introduced under the present administration the manufacturing department is organized as a unit.

In either case, however, there are found two principal functions—those of engineering and of producing. It is the business of the engineering function to find out what is to be done and how it is to be done; and of the producing function to do it. In this respect the plant is like any privately organized concern. The navy yard has not to finance itself, nor does it sell its output, nor does it have to maintain an expensive legal department; but it has the other departments of a large, mechanical business.

The commanding officer of a ship may request repairs and alterations, or they may be suggested by the navy yard or the Navy Department. Any such request or suggestion is investigated by the engineering function at the navy yard. The officers of the ship know they want something done, and it is the business of the officers of the yard to bring to their requirement the knowledge of modern practice and methods and what has been done on other ships and with what results and what can be mechanically and economically accomplished; in other words, to bring to the work a knowledge of engineering. For this sort of work the demand is greater for naval architects and marine engineers than for mechanical engineers; although there is a great deal of the work that is strictly mechanical, such as hoist

*Naval constructor, U. S. N., Navy Yard, Boston.

machinery, pumps, etc. There is a great deal of electric and radio engineering which electrical engineers from civil life could do. Ordnance engineering, however, is exceedingly special. The job having been investigated thoroughly and decision made as to what to do, it becomes necessary to prepare plans, specifications, estimates, bills of material, etc., and refer the request to the proper authority.

The Engineer in Peace-Time Operations

When work is authorized and the proper manufacturing orders issued, it becomes the province of the producing department to get the work done. The shops are operated by a civilian force and are in charge of civilian foremen. The drafting and estimating are done by civilian draftsmen and estimators, in charge of civilian chief draftsmen and chief estimators. Commissioned officers of the line and of the staff of the navy are at the yards for general supervisory and engineering purposes.

In peace-time there are practically never any engineers between these commissioned officers and the civilian foremen, for the obvious reason that there is no opportunity for an engineer in such a position to advance. The higher positions are all held by commissioned officers of the navy. To be sure, an occasional young man comes into the navy yard for a time to gain experience, but he must seek his advancement elsewhere.

Place for Engineers in War-Time

And in war-time it will be necessary to have commissioned officers in charge, not only because of the military relation of the plant, but because those in responsible charge should be familiar with the work and organization. But there is a great opportunity for mechanical engineers in intermediate positions, between the civilian foremen and the commissioned officers, and, in fact, to replace some of the commissioned officers. It would be expected that shortly after the necessity for putting the navy on a war footing was discerned, the majority of the line officers would be sent to sea from the navy yards. At the same time the yard forces would be doubled, and then trebled, working in two or perhaps three shifts. Thus there would not be enough staff officers to go around.

This, then, is the opportunity for the mechanical and industrial engineer to get into the operating organization of the plant. There is some opening for him in the engineering part of the work, although this function offers better attraction for the naval architect, the marine and the electrical engineer.

Any fair-sized yard could use six engineers in the engineering department and twelve mechanical engineers in the mechanical department, with no trouble whatever to place them. And engineers going into such positions would offer their Government a great service.

War-Footing Work of Navy Yards

In putting the navy on a war footing, the first duty of the navy yard would be to complete the repairs to ships which happened to be at the yard at the time. The second duty would be to convert merchantmen taken over by the Government for naval auxiliaries. Such work of conversion would, in many cases, be very extensive. Then it would be required to maintain the fleet, which would be a much more extensive work than in peace-time, on account of the necessity for keeping to sea more constantly and of operating at higher speeds and under trying conditions. It would be necessary to handle casualties resulting from action with the greatest dispatch, in order to maintain the effective strength of the fleet; and then, of course, with what men and plant that could be spared from these requirements, it would be possible to carry on some new construction.

To Make Application for Navy Yard Work

The possibilities for using mechanical engineers in this sort of work were brought to the attention of the Secretary of the Navy some time since; and he has authorized the labor boards at the various yards to receive applications for this duty. The labor board in a navy yard is its employment bureau, and is, of course, the obvious office to receive such applications. The Secretary has further directed that from time to time these applications be referred to the department; hence any engineer applying to the labor board of the nearest navy yard for registration for this duty in time of need may be sure that his request will reach the Navy Department.

American Steel Foundries Report

In making the report for the highly satisfactory year 1916, President Lamont of the American Steel Foundries takes a conservative stand. The gross sales for the year were $31,361,005.71 as compared with $10,024,870.46 the preceding year, and $19,463,521.05 for 1907, the highest previous gross, and the profit for 1916 was $4,225,809.93. Nevertheless, he says, "It must be kept in mind that a considerable part of the earnings for the year were derived from business outside of our regular line of work, and necessarily of a temporary character. In the judgment of your directors, it would be a mistake to pay out these excess earnings in dividends. They should be conserved until all of our contracts for war materials are finished, and if at that time conditions warrant it, these excess profits should be used to call and retire our 6 per cent bonds and provide for the payment of our debentures when due. At the present time, we are obliged to take from our profits about $750,000 a year for interest on and retirement of bonds and debentures before we have anything for surplus available for dividends. This is equal to 4½ per cent of our outstanding stock. It has been a heavy load in dull years and it will be a great relief to get these bonds and debentures out of the way."

President Lamont states that the extremely hot weather during the summer months, the congested railroad situation during the latter half of the year and labor shortage throughout the year made operating conditions difficult and no doubt materially reduced profits. The company produced 277,371 tons, of which about 200,000 tons were castings and the remainder ingots. The general profit and loss account is as follows:

Earnings from operations (after deducting manufacturing, selling, administrative, head and district office expenses)		$4,842,237.04
Deduct—		
Depreciation		739,413.68
Net profit from operations		$4,102,823.36
Add—Miscellaneous income:		
Interest, discount and exchange	$79,599.89	
Income from investments	15,573.57	
Sinking fund profits	3,970.69	
Miscellaneous	23,842.42	
		122,986.57
Total profit and income		$4,225,809.93
Deduct—Interest charges:		
On borrowed money	$56,589.61	
On debentures	95,274.66	
On bonds outstanding	105,375.83	
		257,240.10
Net profit before providing for bond redemption and debenture retirement reserves carried to balance sheet		$3,968,569.83

President Lamont says that the prospects for 1917 are favorable. All plants are running to capacity; the company already has on hand orders enough to carry it well into the second half of the year.

Not the Time to Penalize Efficiency

Said Mr. Lindabury, in Arguing for the Steel Corporation in the Dissolution Suit in the United States Supreme Court —Justices Show Keen Interest and Ask Numerous Questions

WASHINGTON, March 13, 1917.—"In view of the record before you, which is clear and undeniable, I feel that I may properly urge upon you that this is not the time, when we are seeking to mobilize our industries, to penalize a great corporation because of its efficiency."

With the above impressive words, Richard V. Lindabury concluded his able argument for the United States Steel Corporation in the dissolution suit. The argument on the appeal of the Government from the decision of the District Court under the anti-trust law for the dissolution of the corporation was begun in the United States Supreme Court, Friday, March 9. The importance of the case, to which the court assigned 12 hours, four times the usual allotment, was reflected not only in the array of counsel on both sides, but in the large gathering of eminent lawyers not directly connected with the case, the law departments of more than a score of big industrial corporations being well represented.

G. Carroll Todd, assistant to the Attorney General, opened for the Government, presenting the case against the corporation very exhaustively. He was followed by Mr. Lindabury, who argued in favor of the affirmation of the decision of the court below, which found that the big steel combination was not formed in violation of the Sherman act. Henry E. Colton, special assistant to the Attorney General, followed in an elaborate statement, largely statistical, designed to show that the various subsidiaries combined to form the Steel Corporation manufactured competing lines of products and were active rivals of each other until brought together in what the Government's brief denominates the "super-combination." David A. Reed supplemented Mr. Lindabury's argument, discussing in detail what he claimed to be the non-competitive character of the subsidiaries at the time the corporation was organized. Cordenio A. Severance for the appellees discussed the application to the corporation's case of the various decisions of the higher courts under the anti-trust law. To-morrow George W. Murray will present an argument on behalf of the so-called Rockefeller interests represented in the case and Solicitor-General John W. Davis will then close for the Government, dealing chiefly with the provisions of the Sherman act as applied to this case.

Only seven of the nine Supreme Court judges are hearing the arguments, Justices McReynolds and Brandeis absenting themselves because of their connection with the Department of Justice while the case against the corporation was being prepared and tried in the court below. All the members of the court followed the arguments with close attention and frequently interrupted counsel with questions and suggestions as to the elaboration of particular points.

Argument for the Government

In opening the case for the Government, Mr. Todd described briefly the organization of the constituent companies making up the United States Steel Corporation and enumerated the chief products of the industry. He emphasized the "free and open competition prices of iron and steel products" in 1897 and 1898, insisting that, while output greatly increased and cost of production declined, the competition, "though keen, was not destructive." The consolidations between 1898 and 1900, he declared, were formed "not as an incident of normal growth, but with the purpose and effect of unduly restricting competition," and still exist under the guise of a holding company, "each dominant in its respective field but brought together in one super-combination of overwhelming power, the existence and operations of which are maintained in violation of the anti-trust laws."

Mr. Todd devoted considerable time to a discussion of the effect on prices of the combinations of 1898 and 1900, quoting from the decision of Judges Woolley and Hunt in the District Court to show that the control acquired over the branches of the industry to which the combinations particularly related "extended in some instances from 80 to 95 per cent of the entire output of the country, resulting in the immediate increase of prices, in some cases double and in others treble what they were before, yielding large dividends upon greatly inflated capital."

ANXIETY IN 1900 ABOUT COMPETITION

Notwithstanding the concentration of control in particular lines of steel manufacture, resulting from the combinations of 1898 and 1900, competition soon began to make itself felt and as the year 1900 drew to a close was threatening to become very active. In this connection Mr. Todd read extracts from letters written by Mr. Carnegie and Mr. Schwab in the latter part of 1900, indicating their anxiety concerning recent competitive developments. He also quoted from THE IRON AGE of Sept. 20, 1900, to show that keen competition was then in progress, that threats on the part of the several combinations in the industry to invade each other's fields were current and in some instances had been carried into effect and that there had developed "a strife between the giants themselves in which heroic measures are often and suddenly taken." He continued:

> Heroic measures were taken. The giants themselves combined. The three great competitors in the fundamentals of the industry—the Carnegie, the Federal and the National steel companies—and the six combinations of competitive units in particular lines of steel manufacture were united in one super-combination with the purpose and effect of suppressing the existing competition between the several units and of forestalling the new competition which was impending.

In describing the organization of the Steel Corporation Mr. Todd specially emphasized the part played by the syndicate which brought about the consolidation and which he declared received fees aggregating $100,000,000. He also dwelt at length upon what he declared to be the enormous over-capitalization of the corporation "which exceeded by $300,000,000 the securities of the subsidiary companies, which in turn were grossly overcapitalized." In support of this statement he referred to the report of the Bureau of Corporations, which he said showed an over-capitalization of between $600,000,000 and $700,000,000.

QUESTIONS BY THE COURT

Justice Holmes interrupted Mr. Todd at this point to ask what bearing the matter of over-capitalization had upon the contentions of the Government with respect to the Steel Corporation, to which Mr. Todd replied that he had specially emphasized this phase of the matter because he wished to show that the corporation had relied upon the advantages of combining and suppressing competition to earn dividends upon a largely inflated captial. The additional acquisitions made by the Steel Corporation after its organization and the history of the Great Northern ore lease, which was surrendered after the Government had filed its petition in this case, demonstrated, Mr. Todd declared, "the continuing unlawful purpose of the combination."

At this point Justice Pitney asked Mr. Todd to state

briefly the substance of the decision of the District Court as construed by the Government, resulting in the following colloquy:

Mr. Todd.—As we read the decision of the four judges, it meant that a combination to be illegal must have complete control of the trade; it must have absolute power to control prices and production.

Mr. Lindabury.—You don't mean that.

Mr. Todd.—That is just what I mean. Judges Woolley and Hunt held that it was a combination of competitors to restrain trade and raise prices but was not illegal as it did not have the power, unaided, to control prices and production. Judges Buffington and McPherson held also, on the same theory of lack of power alone to fix and maintain prices, that a combination of competitive units is not unlawful unless prices are unduly increased, or production unduly limited, or quality of product degraded, or wages unduly lowered, or prices of raw materials unduly decreased, or competitors oppressed. The Government maintains that these theories of law are erroneous, and further that the facts do not support the theories.

The Steel Corporation, Mr. Todd contended, is not the result of natural trade growth, but is a mere instrumentality for combining competing corporations, which together occupy an overwhelmingly preponderant position in trade and commerce in iron and steel products.

THE DEFENSES OF SUBSIDIARY CORPORATIONS

Proceeding to a consideration of the defenses of the subsidiary combinations, Mr. Todd formulated them as follows: 1. That in the majority of instances they were justifiable as normal and even necessary business developments, and that as to the others the question is at least debatable. 2. That their formation was made necessary by the transition from wrought iron to steel. 3. That two of them—the American Steel Hoop Company and the American Sheet Steel Company—were formed to provide additional customers for the semi-finished products of the National Steel Company, which had been formed to supply semi-finished steel to the American Tin Plate Company. 4. That the question of their legality involves separate and distinct controversies which cannot be heard in a single suit without making it multifarious. Attacking these contentions in order Mr. Todd said:

First, the facts already cited to show monopolistic purpose—especially the exorbitant prices paid for the properties which were combined, the enormous fees paid to the promoters for putting them together, the consequent gross overcapitalization, and the violent rise in prices which immediately followed—stamp as mere pretense the contention that normal and legitimate development of trade was the chief object in view. Once for all let it be said that no one denies that greater efficiency may be obtained by enlarging the size of manufacturing units up to a certain point. Nor is the Government asking for any construction of the anti-trust act which would obstruct development along that line. It does very emphatically deny, however, that efficiency in industry is dependent upon combining great numbers of competitors in a given field into one huge corporation of overshadowing size and power. On the contrary it maintains that a point is reached where size becomes unwieldy, costly, and completely lacking in economic justification, and that the combinations here assailed all go far beyond that point.

Second, as regards the statement that the formation of these combinations was made necessary by a fundamental change in the industry, namely, the change from iron to steel, it is enough to say that this change was a gradual one, taking place during the period from 1870 to 1912, inclusive, but being substantially complete as to most important products by the late eighties or early nineties.

Third, as to the American Steel Hoop Company and the American Sheet Steel Company, granting that the purpose of forming them was to provide additional customers for the semi-finished steel product of the National Steel Company, the complete answer is that the latter was admittedly formed for the purpose of supporting and fortifying the American Tin Plate Company. If that company is an illegal combination as charged, it cannot help the Steel Hoop Company and the Sheet Steel Company to say that they were organized along with it and the National Steel Company as parts of a general plan.

Fourth, the contention that the legality of these several combinations involves separate and distinct controversies which cannot be heard in a single suit without making it multifarious is based on a ruling in the United States vs. Reading Company (226 U. S. 324, 372). The very element, however, the absence of which was the basis of that ruling, namely, common control of the several assailed combinations, is present here, all of them being united through the holding company, the United States Steel Corporation. Again, the joining of these cognate complaints against the several combinations, united as they are under one control, obviously avoids a multiplicity of suits and therefore serves the administration of justice. Furthermore the objection of multifariousness was not made at the outset nor even in the answer. That it will not then be considered an appeal is elementary.

Justice Pitney asked Mr. Todd to explain why the Steel Corporation produces substantially less than one-half the merchant bars made in this country, to which he replied:

There are many producers of this article. It can be made in small shops and can be sold in small quantities. It is, therefore, a difficult article to monopolize. Its position in this case is similar to that of cigars in the case against the American Tobacco Company. It will be recalled that in that case the combination had only a comparatively small proportion of the trade in cigars, which are made by hand, and therefore are difficult to monopolize.

CONSIDERATIONS SHOWING A WRONGFUL PURPOSE

Turning to the contention of the defendants that their objects in organizing the big combination were commendable, Mr. Todd said he had not previously discussed the intents and purposes of the parties to the consolidation because the theory of the Government is that this combination by its inherent nature and its necessary effect unduly restricts competition. It was appropriate, however, he said, to show a wrongful purpose as a matter of aggravation, and he therefore cited various considerations, which he said demonstrate that the controlling purpose of the parties was not the enormous development of trade as claimed.

"We have then, in this case," said Mr. Todd, "a vast aggregation of formerly independent businesses combined under one control by means of a holding company with the effect or purpose of suppressing competition between them, actual and potential. That such a combination violates the anti-trust act is not, we maintain with all deference, an open question. If the units so combined, occupying, as we have shown, an overwhelmingly preponderant position in the whole steel industry had been combined by a pooling agreement or in the old form of trust, there would be none to dispute the illegality of the transaction. It could not be that the law prohibited the combination of competitors by simple agreement or in the old form of trust and at the same time permitted them, in a form more enduring and more effective, as a means of suppressing competition."

Justice Pitney, reverting to the effect of the combination upon prices, remarked that he was familiar with an old saying that "iron is either a prince or pauper" and asked Mr. Todd to indicate tables in the record showing price tendencies from 1898 onward. Mr. Todd cited several tables which he said would supply this information.

ATTACKS MORE IMPORTANT DEFENSES

In concluding his argument Mr. Todd devoted his attention to what he referred to as the more important defenses of the corporation. Taking up the contention that the purpose of the organizers was to combine under one control successive or supplementary stages of the steel industry—in the language of the trade, to "integrate it"—he declared that if this theory of integration were accepted it would wipe the anti-trust law from the statute book. No one, he said, would deny the advantage of concentrating under one management the various stages of steel manufacture from the ore mine to the finishing mill. This could be done, however, and could be best done just as economical size could be attained, "without setting up in every branch of trade a combination of competitors with power to exercise substantial dominance over the rest."

Referring to another defense of the corporation that the combination was formed in order to attain efficiency and promote foreign trade, Mr. Todd said that this was but another way of saying that good intentions can save the combination from illegality. Assuming, however, that the contention is legally relevant, no basis of fact on which it would have to rest has yet been established. At the very least, Mr. Todd declared, the burden was upon the defendants to show that the com-

bination is more efficient than its smaller competitors. This they have not done. On the contrary, as another defense, they have pleaded that the combinations position in the trade has declined; that its smaller competitors have outstripped it in the race; thus, at one and the same time, destroying the defense now under consideration and confirming the contention of the Government that, while increased efficiency may result from the enlargement of manufacturing units within limits, combinations of competitors on the huge scale exemplified in this case are not only contrary to law but also are completely lacking in economical justification.

As to the necessity of a combination of such size in order to promote the foreign trade in steel products, Mr. Todd asserted, there was nothing to support such a claim.

Referring to the claim that the combination's proportion of the trade has decreased, Mr. Todd said it was true that there had been some decline from the high-water mark reached immediately after its formation, but no such decline as to curtail the power of the corporation, and, absolutely, its trade and resources have increased enormously.

Reduced to its final analysis, Mr. Todd said, the theory of law urged upon behalf of the Steel Corporation "comes to this, that a voluntary combination of competitors is not a combination in restraint of trade unless it includes every efficient competitor in the particular field. We submit that this is not the law, but that, on the contrary, as early decided by this court, 'the law reaches combinations which may fall short of complete control of a trade or business.'"

Mr. Lindabury's Argument

Mr. Lindabury, in beginning his argument in defense of the Steel Corporation, told the Court that the defendants were unable to accept the "Summary of the Evidence" prepared by the Government as either a fair or a complete epitome of the evidence in the case. It purported to be complete only as to "what the Government considers the essential points," which must be the excuse for ignoring much evidence which the court below considered of sufficient importance to quote at length in its opinion. "Thus," he said, "it confines to two footnotes all reference to the contents of 11 entire volumes of testimony of consumers and competitors on the subject of the genuineness, activity, and generality of competition in the steel trade and omits all reference to the evidence comparing the decline in the prices of steel products with the rise in the prices of general commodities during the life of the Steel Corporation, and in many other respects it ignores important features of testimony, especially the unchallenged statistics which show that while the Steel Corporation makes 45.7 per cent of the country's production of finished roll products, it makes but 40.9 per cent of the country's consumption—the difference being due to the enormous export trade which the corporation has created." As the Government's "Statement of the Case" is based upon its "Summary of the Evidence" Mr. Lindabury said, it was, of course, open to similar objection but within the time available it had not been possible to specify each objection in detail and, therefore, without undertaking to do so, counsel submitted for the use of the court an abstract of the proofs and exhibits similar to that supplied to the court below.

Justice McKenna here interrupted Mr. Lindabury to ask whether the document to which he referred as "an abstract of the proofs" was the one before the court bound in white paper, to which Mr. Lindabury replied in the affirmative, adding:

"And it is as white and colorless on the inside as on the outside."

Continuing, Mr. Lindabury said he would first consider the question as to the inherent effect of the organization because, of course, if the inherent effect was to restrain trade or produce a monopoly, he would agree with counsel for the Government that it was of no account what the motive might be. No matter how good the motive, it could not atone for or offset the necessary result of the transgression of a policy declared by Congress. Whether or not the inherent effect was to restrain trade or create a monopoly must depend in large measure upon the amount of competition that was suppressed, upon the control that was acquired over the production of steel, and upon the control that was acquired over the raw materials of the industry.

SAYS TABLES MISLEAD

Referring to a large number of tables cited by the Government to show the competition existing between the subsidiary companies before the Steel Corporation was formed, Mr. Lindabury said these figures would be more or less confusing unless the court understood the principle on which they were made up. "They put in," he said, "statistics of production merely of these various companies, whether this was production for use within the corporation, ultimately to appear in some other form, or production for sale. A vast percentage of the articles set down in these tables never reached any market. They were used up by the companies themselves in producing finished articles, semi-finished articles, or articles manufactured from what is called finished steel. So, too, the production set down here was to a very considerable extent non-competitive even when sold, because it was produced by companies in different territories which, for geographical reasons, freight rates, etc., did not sell their productions in competition with each other. I shall ask your honors to turn to the defendants' brief in order that you may quickly get a general idea as to this competitive situation."

"Please state it so that the point may be understood by one who does not look at it," said Chief Justice White, "because I do not like to look at things."

Mr. Lindabury smilingly complied with the request of the Chief Justice, quoting figures from the Government's brief, showing, as he claimed, that there was little real competition between the subsidiary companies prior to their combination.

"They sold a little pig iron," suggested Justice Pitney.

"That is true," replied Mr. Lindabury, "but there was no competition and there never has been among these companies in the sale of pig iron. They were users. There is a special reason for each one of those sales, but the Government makes no claim that there was any competitive condition in the sale of pig iron."

"I understood the point to be made," said Justice Pitney, "that the Wire Company, itself, was made up of a combination of competitors."

"The testimony referred to in the brief," responded Mr. Lindabury, "covers that situation with regard to the formation of these subsidiaries. I am now dealing with the formation of the Steel Corporation, what they call the super-combination. There is another story about the formation of the Wire Company. It was a formation of competitors to a considerable extent, Mr. Todd being right about that. These subsidiaries merged into this corporation 16 years ago and I will state now what Justice Hunt and Justice Woolley found. They found those subsidiaries were organized in restraint of trade with monopolistic intention and acquired monopolies, but I call attention to the fact that their percentages of production as compared with competitors, which were high in the beginning, one of them being as high as 90 and another 80 per cent, rapidly declined, and they lost their primacy, they lost their monopoly, they lost their power of control, at the time the Steel Corporation was formed. The situation in the industry, when they were formed, was very remarkable and Judges McPherson and Buffington explained it and justified the formation of those subsidiaries on account of those conditions. Judges Hunt and Woolley said they were organized with intent to acquire monopoly and did so, but that they had lost it when the Steel Corporation was formed. They found that the Steel Corporation was formed for the purpose of acquiring a monopoly, as Mr. Todd has said, but that the gentlemen who formed the Steel Corporation misunderstood the

situation and did not estimate it accurately and did not get what they thought they were getting, a monopoly. In other words, they made a mistake. They thought when they organized the Steel Corporation that they would get a monopoly, but they found the power of the subsidiaries had so diminished that they had lost their efficacy. That was the view of Judge Hunt and Judge Woolley."

CHIEF JUSTICE'S INQUIRY

Referring to the evidence showing that the Carnegie, Federal and National Steel Companies, under certain conditions, made certain products competing with each other's output, Chief Justice White asked whether the stockholders of the three companies were identical, to which Mr. Lindabury replied that the three companies had the same controlling stockholders, the majority of the stock being held by the so-called Moore-Leeds group. Mr. Lindabury also called attention to the fact that while the Government's prayer for the dissolution of the National Steel Company was put into the original petition, the claim that this company was organized in restraint of trade has since been withdrawn.

The Carnegie and Federal companies, Mr. Lindabury said he was prepared to concede, were both large producers of steel rails, but while they were in a sense competitors, it should be understood that one was located in Chicago and the other in Pittsburgh, the great bulk of the output of each company being sold in its own territory. All of the witnesses produced, including those called by the Government, referred to these geographical facts as modifying the apparently competitive situation to a very great extent. To the extent that billets and plates and a few other articles were produced by these companies in competition, Mr. Lindabury said the testimony showed that they were for the most part by-products and were only sold occasionally as surplus.

Mr. Lindabury warned the court not to be misled by figures quoted in the Government's brief concerning the pools that were in existence before the Steel Corporation was organized. The figures relating to these pools, he said, did not to any reasonable or reliable extent represent the competition between the manufacturers in the sale of the products named.

Justice Pitney here suggested that a letter from Mr. Carnegie, read by Mr. Todd, indicated that as the result of a pooling arrangement, which antedated the formation of the Federal Steel Company, the Illinois Steel Company got one million dollars more profit out of the business than it was entitled to. The justice suggested that this clearly indicated there was competition between these companies, to which Mr. Lindabury assented, but reiterated that it was comparatively small and was modified by geographical circumstances.

Commenting upon Mr. Todd's statement as to the manner in which the price of steel rails was raised to $28 per ton and has since been continued at that level, Mr. Lindabury said the situation with respect to rails was a peculiar one which should be fully understood by the court.

RAILROADS CHANGE METHODS

"The very year that the Steel Corporation was formed," he said, "the railroads changed entirely their method of purchasing rails. The records show that they used to trade rails for freight in the old rebating days. They were compelled to stop that about 1890, and they then tried something else. Of course, the freights paid by these corporations to the railroads greatly exceeded the cost of the rails and therefore it was of very great importance to the railroads that they should receive as much freight as possible from the steel manufacturers. The Pennsylvania Railroad led off in 1891 by adopting a budget for the year and contracting for the whole year's supply of rails. Having determined the amount of the rail tonnage for the year, the railroad then negotiated with the larger manufacturers to obtain a satisfactory price and then divided the tonnage pro rata among all of the steel mills contributing to the Pennsylvania line. That was followed immediately by all of the leading railroads, and has obtained ever since, and the price since that time has been fixed without competition by the railroads themselves upon that basis. This accounts for the $28 per ton price of rails, which has taken the production of rails practically out of the competitive market from that time to this."

The percentage of production acquired by the combination at the time of its organization, Mr. Lindabury said, was important, but he did not agree at all with the Government that mere preponderance in an industry is enough to make the suppression of competition or the acquisition of control undue.

Taking up the Government's charge that the corporation monopolized the production of ore, Mr. Lindabury declared that it never acquired as large a supply of ore as its competitors. The Government's own witnesses testified that a steel company, to be properly equipped, should have a 50-year supply and on this point all witnesses were agreed. The Steel Corporation, however, has had something less than a 43-year supply, and it never got a percentage of the ore in the Lake Superior district as large as its proportion of the trade, and for this reason all of the judges in the court below said that the charge that the Steel Corporation had obtained a monopoly of ore was utterly refuted.

As to coal, Mr. Lindabury said that in the great fields in West Virginia and Pennsylvania, known as the Pocahontas coal region, the Steel Corporation had only 9 per cent of the coke and coal. He added that the United States Geological Survey recently issued a report showing that the known deposits of coal are sufficient to supply all of the needs of the country at the present rate of consumption for 6000 years.

POLICY OF THE CORPORATION

In conclusion Mr. Lindabury discussed the policy of the Corporation towards its customers, its competitors and its employees, asserting that it conformed in all respects to the high ethical code stringently enforced by its officers and especially by Judge Gary. All possible efforts were made, he said, to improve the products of the Corporation, and at no time was its output permitted to deteriorate. In the treatment of its employees everything was done by the Corporation "that the most ardent uplifter could ask."

Chief Justice White manifested special interest in the acquisition of the stocks of the corporation by the employees and was informed by Mr. Lindabury that at the time the testimony in the case closed the workmen in the various plants owned more than $40,000,000 worth of the common stock. In this connection, Mr. Lindabury drew the court's attention to the fact that not a single ex-employee of the corporation could be found to go on the stand to testify as to any bad treatment he had received. It was also significant, he said, that not one of the many thousands of customers was willing to testify that he had ever been discriminated against or had ever received anything but the fairest treatment. The corporation had never exacted a solitary condition from a customer and had never sold a ton of product for the purpose of injuring a competitor.

Replying to a question by Justice Pitney as to "who owns the industry in the Birmingham district," Mr. Lindabury said that the corporation controlled the Tennessee Coal, Iron & Railroad Company, but that there were several other very large concerns in that district.

Reverting to the law-abiding course uniformly pursued by the Corporation, Mr. Lindabury quoted a report made by James R. Garfield who, as Commissioner of Corporations, investigated the big combination in 1907, and who in an official communication informed President Roosevelt that the corporation had not committed a single act in violation of the Sherman law. Mr. Lindabury also quoted from the testimony of Mr. Bacon concerning the code of ethics enforced by Judge Gary, who, Mr. Bacon said, "has done more for the United States Steel Corporation in its development and the benefits it has brought all hands than any one man since its formation, and who has made it a cardinal point of his policy and has tried his best to inculcate upon all the sub-companies the fact that there was a new order of things and that there were new rules of the game in dealing with competitors as well as in other human relations." W. L. C.

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THE IRON AGE

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Change in Western Editorship

O. J. Abell, Chicago, who has been Western editor of THE IRON AGE for the past six years, has resigned to engage in business for himself. He has established offices at 565 Washington Boulevard, as a manufacturer's representative, and plans to make a specialty of conveying apparatus for industrial plants. Mr. Abell's career in iron trade journalism began in 1906 and he has been continuously in that work, with the exception of three years in which he was connected with a manufacturing company. His preparation included in the beginning practical experience on the machine shop floor and later a course in Case School of Applied Science at Cleveland from which he graduated in 1906, as a mechanical engineer. His contributions to THE IRON AGE, particularly those dealing with methods, plants and processes of important iron and steel and metal-working companies, have been marked by an unusual grasp of the most recent developments in those lines and appreciation of their economic bearing. His associates on THE IRON AGE wish him in his new undertaking the large success to which his talent, his energy and his business experience entitle him.

Charles Lundberg succeeds Mr. Abell as THE IRON AGE'S Western editor and he goes this week to Chicago to take up his new duties. Mr. Lundberg joined the staff of this paper six years ago, taking charge of its New York machinery market and of its non-ferrous metal market report. His work in both departments was highly successful and in the past two years he has covered, in addition, the important iron and steel market work in Philadelphia. His earlier training included an apprenticeship in the machine shop which was followed by several years in the daily newspaper field. He thus brings to the responsibilities of the Western editorship a wide and valuable experience.

Closure in the Senate

Will the adoption of the closure rule by the United States Senate result in the passage of radical legislation detrimental to the best interests of the country? This is a question naturally suggested by the recent action of our highest legislative body under the pressure due to conditions connected with the European war and the necessity of this country taking a decided position in defense of its rights.

It was unfortunate that this departure from the time honored or dishonored custom of the Senate was not made at a time when there was no momentous question pending, because a new policy of large importance should be adopted on account of its wisdom in general legislation rather than to meet a single emergency. We do not, however, question the propriety of the President recommending the change. Surely he had great provocation on account of the defeat by a small coterie of Senators of a bill whose passage was clearly demanded by the most imperative dictates of patriotism, and apparently it was necessary that very unusual conditions should arise to jolt the tradition-bound Senate from its rule of unlimited debate. Many times before, the Senate had tried to free itself, but the effort to limit debate was always defeated by the filibusterers.

Recalling the history of the Senate shows that unlimited debate has not prevented unjust legislation to which manufacturing interests have been opposed. It enabled a single Senator or a coterie of Senators to prevent the passage of the so-called force bill years ago and of several rivers and harbors bills in recent years, as, for example, when Senator Burton filibustered against a rivers and harbors bill shortly before his retirement from the Senate. Generally, however, the refusal to limit talk—for it was not entitled to be called debate—has resulted in delay rather than defeat of obnoxious measures and it is well known that some of the most radical legislation in recent years, such as the Underwood low tariff bill, the riders attached to appropriation bills to prevent efficiency tests in Government work and the Clayton act, have been passed by the Senate without serious opposition. Labor unions have dominated the Senate as well as the House.

The lower branch of Congress no longer is a deliberative body. A small and often arbitrary and even tyrannical committee controls just as the czar-like speaker did years ago, and debate on the most important measures can be curtailed in a drastic manner. Hence it would be most unfortunate if the Senate also should lose its deliberative character, or if the newly adopted closure rule should prove

an entering wedge for the adoption of more serious curtailment of discussion. We do not believe that this will prove true. The traditions of the Senate are very strongly in favor of free expression of opinion, and the people will demand that it shall be continued in at least one legislative body in the country. The new rule provides that only by two-thirds vote can debate be closed, and not until every Senator has been given an opportunity to talk an hour. Hence it would be necessary to hold the Senate in continuous session for four days or 96 hours before the roll could be called. Obstructionists will be checked, but men who really have something worth hearing to say will be given full opportunity to speak.

The Price of Steel Rails

In the official announcement by the Pennsylvania Railroad in regard to the recent placing of orders for 68,332 tons of steel rails for delivery in 1918, although 205,000 tons were ordered for 1917 and negotiations for a like tonnage for 1918 were begun some time ago, it is stated that the reason for the great reduction in the amount ordered for 1918 is "the extremely high price prevailing for steel rails." It is difficult to understand by what sort of reasoning the railroad company has come to the conclusion that the price of rails is "extremely high" Certainly the price is not higher than is justified by demand, which is very strong not only from the railroads of this country but from those of foreign lands.

If prices of rails be compared with those of other products, they are found low. It is indeed remarkable how much lower they are than those of semi-finished material. The $40 price of open-hearth rails is at least $25 per ton lower than open-hearth billets, and when prices of rails are compared with those of finished steel products, the difference is even more striking. For example, the minimum quotation on plates for delivery at convenience of the mill is now $90. Probably the real secret of the attitude of this railroad system is that it has not yet come to realize it is reasonable to expect that in future years rails will fluctuate in accordance with the law of supply and demand as do other materials. The $28 price on Bessemer and $30 on open-hearth were maintained for so many years that buyers still are likely to look upon any higher prices as unreasonable.

The Unplaced Engineer in War Time

Following the assertion a few weeks ago in this column that an inventory of the personnel of the mechanical engineering profession was desirable in the matter of industrial preparedness for warfare, Government efforts to get skilled workmen as well as works managers for ordnance plants are now to be noted. Private plants which have been opportuned in the last few weeks may at the moment release employees willing to accept Government service, but with any general distribution of munition contracts to outside plants, it is hardly reasonable to expect such encouragement. Should factories come under Government control, the situation takes on a still different color.

What is especially illuminating is the bidding which is reversing the current started some months ago away from Government workshops and which emphasizes the scarcity of certain classes of trained help for any sudden expansion. If there are adequate numbers to meet the demand, no one has a directory of their names or addresses. If there are trained minds which have not the specific experience required, there is neither a way of finding them nor, when found, of providing for an intensive preparation for the emergency job. Besides mobilizing the mechanical engineer according to mechanical engineering war pursuits, as in shop operations, there is need for recruiting these ranks by giving an opportunity—just how does not seem clear—for training in industrial management the engineer who has no special qualification for immediate Government service.

The Supply of Locomotives

If the railroads had 15 per cent more motive power than they have, the traffic situation would be a great deal better. Shippers have all observed that the difficulty of the situation is not that there are not cars but that the cars do not move. Cars that are stationary block the movement of other cars, and shippers find there is as much difficulty in moving cars after they are loaded as in furnishing them for loading. Certainly if there were 15 per cent more motive power the situation would be altogether different. There is a reason for selecting 15 per cent for use in the comparison, as an effort will be made to show.

The freight ton-mileage of the railroads in the fiscal years 1906 and 1913 can be taken as full normal. Therefore the rate of increase in the seven-year period furnishes an index as to the volume of traffic that should be provided for in following years. Taking the locomotives during the fiscal years as equal to the mean between those at the beginning and end of the fiscal years, the following statement can be made: From the fiscal year 1906 to the fiscal year 1913 the increases were as follows: Number of locomotives, 24.7 per cent; tractive power per locomotive, 24.1 per cent; total tractive power, 50.1 per cent; ton-miles of freight moved, 39.2 per cent.

It may be assumed, for a few years at any rate, that the tractive power per locomotive increases uniformly, and larger locomotives are designed and new large locomotives replace old small locomotives. Hence to maintain the rate of increase in tractive power in this period, the number of locomotives should increase as it did from 1906 to 1913. On June 30, 1913, there were 63,378 locomotives in service. According to the former rate of increase there should be 71,900 on June 30, 1917. The latest statistics show 65,099 on June 30, 1915. It may be estimated from the statistics of the *Railway Age Gazette*, of the number of locomotives built in the United States and Canada, with allowances for Canadian output and our own exports, that there were about 600 new locomotives put in service in the second half of 1915 and about 2,000 during 1916. It can readily be computed that if this num-

ber was just sufficient to maintain the equipment, locomotives were abandoned only at a rate which would indicate an average life of 37.6 years, which is absurd. Assuming that one-half the locomotives ordered in 1916 are delivered in the present half year, there are 1400 to be added to the 2600 just mentioned, making 4000 added in two years, June 30, 1915, to June 30, 1917. Assuming an average life of 20 years for a locomotive, there would be 6500 locomotives abandoned in two years, so that the number in service would decrease by 2500 instead of increasing, and would be 62,600 on June 30, 1917, instead of the 71,900 computed as the prospective number if the former rate of increase had been maintained.

The number apparently required is 15 per cent greater than the number computed as in prospect, this being the percentage mentioned at the outset of this discussion. Shippers who have observed the inefficient performance of many locomotives in recent months are likely to assert that the 6500 locomotives which analysis indicates should be abandoned in two years have not been abandoned, but are cumbering the tracks trying to do work they are no longer able to perform. They may swell the statistics relating to the number of locomotives in existence, but they do not aid materially in actual performance.

Of course what occurred is that after June 30, 1913, the railroads concluded they were well fixed as to motive power and poorly fixed as to funds and prospects of earnings in future. They concluded also that the United States was in an industrial depression, more or less, and the traffic would not grow rapidly. The present traffic they denominate abnormal and ascribe it to the war. This is all a matter of opinion. The bald fact is that if industrial activity increased from 1913 to 1917 as it did from 1906 to 1913 it would be of about the present volume, and the further fact is that if the railroads had improved their facilities in the past four years as they did in the preceding seven they would be fully able to handle the traffic without congestion or shortage of either cars or motive power.

While the news from week to week as to locomotive orders placed is interesting, it is not illuminating as to the extent by which the railroads are improving their position, unless there is a constant factor by which the orders can be gaged. As the number of locomotives in service is about 65,000, it will be observed that if the average life is 20 years the number can be maintained by 3250 new locomotives being put into service each year. As already noted, from 1906 to 1913 the number increased by 25 per cent, the average tractive power by 20 per cent, and the total tractive power by 50 per cent. While the locomotives added are much more powerful than those discarded, to maintain the number does not allow for the normal rate of increase in traffic, which increase represents a doubling about once every 12 years. Probably the railroads should buy from 4000 to 5000 locomotives per year. In 1915 they bought less than 1000 and in 1916 about 2000. Thus far this year they have bought a few over a thousand. Prices are very high and deliveries are very slow, so that the railroads cannot make up now what they lost by not buying in 1914 and 1915 when prices were low and deliveries good.

The American Merchant Marine

In these days when the demands upon the national treasury are so numerous, it is not surprising that newspaper reports, in announcing the decision of the Supreme Court that the 5 per cent clause of the Underwood tariff law is invalid, have emphasized the fact that this decision has relieved the treasury officials of the unpleasant duty of refunding from $25,000,000 to $30,000,000 paid by importers. The really important fact of the news is, however, that the decision marks the complete failure of another effort to aid the American merchant marine.

The clause inserted in the Underwood tariff law provided that all goods coming to this country in American bottoms or in ships of nations included under the "most favored nation" clause should be admitted at 5 per cent less than the usual duties. The court holds that this provision is inoperative because it conflicts with existing treaties. After the law was enacted, the Attorney General decided it was void and the Treasury Department collected duties in full. Litigation followed and it is now clear that some other method of upbuilding the American merchant marine must be adopted. Treaty matters are in a chaotic condition, many of them having been abrogated under the seamen's act, and one of the problems which will confront the country after the war will be the remaking of treaties with many countries. Perhaps at that time it will be possible to devise some plan of giving substantial encouragement to the American merchant marine.

Decision in Buffalo Controversy

WASHINGTON, D. C., March 13, 1917.—The Interstate Commerce Commission has found that the present adjustment of rates on coal and coke from points in the Reynoldsville district served by the Buffalo & Susquehanna Railroad Corporation to Buffalo, Lackawanna and Harriet, N. Y., and other points in the so-called Buffalo-Black Rock switching district is unduly prejudicial to complainants and unduly preferential to the Rogers-Brown Iron Company to the extent that the group rate on coal from the points of origin to the territory of destination named exceeds 80 per cent of the rate contemporaneously maintained on coke from Tyler and Sykes to Lackawanna. The complainants in this case, the Buffalo Union Furnace Company and the Wickwire Steel Company, operate blast furnaces and manufacture pig iron at Buffalo and Harriet, N. Y., respectively. In their complaints they challenge as unjustly discriminatory the relationship of rates to Buffalo, Harriet and Lackawanna, N. Y., and other points in Buffalo territory on coal and coke from the Reynoldsville district, and also the relationship of rates to the same points of destination on coke from the Reynoldsville and Connellsville districts. Claims for reparation in sums aggregating $325,000 were made at the outset of this proceeding but were subsequently abandoned.

In stating that an order will be entered requiring the removal of the undue prejudice now existing, the Commission asserts that it has been unable to find a tariff in its files which justifies the application of the $1.05 rate on shipments of coke from Tyler and Sykes to the Rogers-Brown Iron Company at Buffalo, the published rate to Buffalo being $1.25 per net ton.

The Pallau Steel Spring Company, Mount Clemens, Mich., announces its re-incorporation as the Superior Steel Spring Company.

CORRESPONDENCE

Molybdenum in the Steel Industry

To the Editor: I was surprised to see a statement regarding molybdenum, in your issue of Jan. 4, 1917, to the effect that "This material has proved unsatisfactory from practically every standpoint." In a later paragraph, however, reference is made to the "increased durability of molybdenum-treated steels under quick and enormous expansion and contraction tests" but the concluding sentence says that the alloy should not be seriously considered in the steel industry. Permit me to suggest that the writer of the article conveyed a totally wrong impression to the reader.

I am in a position to state with absolute confidence that the great value of molybdenum has been demonstrated time and again in the European war and that many of the leading steel companies in America fully appreciate its usefulness and are clamoring for the material which has quadrupled in price since the war began. If this alloy had proved unsatisfactory from practically every standpoint, is it likely, may I ask, that German agents would have exerted such extraordinary efforts before the war to secure all the molybdenum they could from this continent? I am much interested in the molybdenum properties owned by the Steel Alloys Corporation of New York City, in Renfrew, Ontario, Canada, and have abundant proof that Germany left no stone unturned to obtain this alloy in 1913 and 1914.

Molybdenum Steel in Large Guns

French military authorities know that the wonderful 75s, about which so much has been printed, owe their notoriety entirely to the fact that the inner lining of each gun contains a percentage of molybdenum which increases the life about 20 times. The same remark applies to the guns of Britain's naval pride, the Queen Elizabeth, and other important dreadnoughts of that country. It has been proved that tungsten-lined guns crystallize after a certain number of shots have been fired and are rendered practically useless, whereas molybdenum-lined guns seem to last indefinitely.

Tungsten and vanadium render steel extremely brittle and the effect of shell fire on tungsten armor plate would be similar to that produced on a pane of glass if a stone were thrown at it. A shell might penetrate molybdenum armor plate but leave only a hole which could be plugged. Steel companies in this country are slowly waking up to the importance of molybdenum as an alloy and the Steel Alloys Corporation could produce proof of many offers received for its entire output from some of the best known steel companies.

The Ford Motor Company could doubtless give some highly interesting details about the numerous efforts it has made and is making to secure molybdenum to harden the parts and bearings of Ford cars. It seems very improbable that a highly successful corporation of this character and the steel companies mentioned above would be in the market for something which has "proved unsatisfactory from practically every standpoint."

I can state positively that molybdenum is one of the greatest alloys yet discovered and if produced in sufficient quantities would replace tungsten and vanadium for hardening steel. Wonderful strides have been made in the methods of concentrating the molybdenite ore and in the production of the commercial ferro-molybdenum with the aid of the electric furnace.

With the recognized attitude of fairness which has always characterized THE IRON AGE, I feel that you will publish this letter and thereby controvert the somewhat misleading article.

E. H. CLARKE.

New York City, March 2, 1917.

To the Editor: Referring to the communication of E. H. Clark, 27 William Street, New York City, pertaining to my article in THE IRON AGE of Jan. 4, entitled "Metals and Alloys in the Steel Industry," I mentioned very clearly:

> Foreign steel makers are said to use considerable molybdenum. In fact, fair quantities of the alloy have been shipped over for use in gun steels. The addition of a small amount is supposed to increase the life of guns materially. This is apparently due to the increased durability of molybdenum treated steels under quick and enormous expansion and contraction tests. Practically no gun steels containing molybdenum have been manufactured in this country, but the reason for this is not apparent.

From the American standpoint, however, as I also stated in the same article, "Molybdenum has proved unsatisfactory from practically every standpoint," for the reasons which I have also mentioned, namely:

> Some years ago molybdenum looked very promising as an alloy in tool steel, but unfortunately it was found that while the steel had very often remarkably efficient cutting qualities, it frequently ran with fine hairline seams and, very peculiarly, the molybdenum tended to volatilize out of the surface of the steel on heat treatment. Also in magnet steel it has not proved as satisfactory as tungsten. Metallurgically considered, molybdenum should have about twice the efficiency of tungsten.

Please understand that I do not wish to contradict what Mr. Clark says, but the fact remains that practically no molybdenum is being used at the present time by American steel manufacturers.

DE COURCY BROWNE,
Metallurgical Engineer, Goldschmidt Termit Company.
New York City, March 12, 1917.

British Specifications in Foreign Languages

The British Standards Committee, with a view to assisting the maintenance and extension of British trade after the war, has determined to translate its specifications into French, Spanish and Russian, to give metric equivalents of English measures and to issue the specifications at a much lower price than has hitherto been possible. This fact was incorporated at the annual report of the Council of the Institution of Mechanical Engineers, which held its seventieth annual general meeting in London Feb. 16.

Arrangements are being made to establish local committees in the colonies and in foreign countries to obtain information and facilitate commercial transactions. The institution has appropriated a sum of $2,500 as a donation to the fund for this purpose.

Michael Longridge was elected president to succeed Dr. W. C. Unwin, who has been president for the last two years. Dugald Clerk, Sir Robert Hadfield and Mark Robinson were e'ected vice-presidents.

The Boston Branch of the National Metal Trades Association held its annual meeting at Young's Hotel, Boston, Mass., March 7. Robert G. Morse was elected president; Frank Burgess, Boston Gear Works, vice-president; Winslow Blanchard, Blanchard Machine Company, treasurer; Martin B. McLauthlin, George T. McLauthlin Company, and H. W. Woodworth, American Tool & Machine Company, members of the executive committee.

The Pacific Coast Steel Company is installing a third open-hearth furnace in its plant at Seattle, Wash., with capacity of 150 tons daily, giving the company a total output of 450 tons each day. The plant is also turning out 150 tons daily from the puddling furnaces. The company reports that its business is showing a remarkable increase, and it contemplates a plant in Portland.

The Canton Foundrymen's Association has been formed by the foundrymen of Canton, Ohio. S. W. Swartz, general manager Canton Steel Foundry Company, is president, and Frank Burger, Alliance Foundry Company, is secretary and treasurer.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until March 27, schedule 810, for 200 tons of ferromanganese, 200 tons No. 2 pig iron, and 200 tons of No. 3 pig iron, all for Washington.

WILL DECLARE EMERGENCY

And $100,000,000 Will Be Available to Expedite Construction of Warships

WASHINGTON, D. C., March 13, 1917.—Pursuant to the provisions of the national defense act of 1916 and the naval appropriation act which has just become a law, the President in a few days will issue a proclamation declaring that a "national emergency" has arisen making it necessary for him to invoke the statutes authorizing him to employ extraordinary methods for hastening naval construction and the prompt delivery of war material for the use of the army as well as the navy. The national defense act clothes the President with power to compel manufacturers to give precedence to Government orders and to take over plants in the event the owners thereof fail to obey the law. The naval appropriation act authorizes the commandeering of shipyards and munitions plants whenever in the opinion of the President such a course should be necessary. The issuance of the President's proclamation will render available the appropriation of $100,000,000 as an emergency fund to compensate shipbuilders and manufacturers for extra expense incurred in expediting the construction of warships and the delivery of material.

The Secretary of the Navy has just concluded a series of conferences with representatives of the leading private shipyards that have been productive of the most gratifying results and it is semi-officially announced that the Navy Department has now no expectation that it will be necessary to commandeer any plants under the authority granted by the naval appropriation act. Not only have the shipbuilders promised to provide for the expeditious construction of all the war vessels already authorized by Congress or that may be provided for hereafter in connection with the present emergency, but an agreement has been reached under the terms of which the profits on these contracts will be limited to 10 per cent net. According to statements made to the Secretary of the Navy by representatives of several leading yards, the profits on merchant construction now in progress range from 20 to 30 per cent and might easily be forced to a much higher figure if the yards were willing to take advantage of the necessities of their customers.

In the effort to mobilize the shipbuilding industry to meet the present or any future emergency the Navy Department will not confine itself to a survey of the plants now or heretofore engaged in warship construction, but will endeavor to enlist the services of every establishment in the country that can build boats, large or small, that can be utilized by the Government for any purpose, including, especially, fast motor boats to be used as submarine chasers.

No feature of the preparedness program is giving the War and Navy departments so much concern as an adequate supply of skilled laborers and competent mechanical supervisors. Both the Secretary of the Navy and the Secretary of War have appealed to the private manufacturers of the country not to entice Government employees to leave their jobs and very satisfactory assurances on this score have recently been received by the departments. The National Chamber of Commerce is co-operating heartily with the Administration in hastening naval construction, in expediting the delivery of war material of all kinds and in inducing all manufacturers to forego profits in excess of a very moderate margin. W. L. C.

The Whitaker-Glessner Company, Wheeling, W. Va., which for a number of years has owned all of the capital stock of the Wheeling Corrugating Company, has arranged to assume the liabilities and assets of that company. Except as to the name, no change has been made, and the business of the Wheeling Corrugating Company will, on and after March 15, be conducted by the present organization under the name of Whitaker-Glessner Company, Wheeling Corrugating Department. The branch offices and warehouses will be continued as now located.

Engineers Will Meet in Chicago

A plan to promote the welfare of the engineering profession has just been completed by the sub-committee on plan of the National Committee on Engineering Co-operation, consisting of Hunter McDonald, Isham Randolph, F. H. Newell, M. L. Cooke and C. E. Drayer, and the report of this sub-committee will be considered at a meeting to be held in Chicago. On the evening of March 29, at 6.30, an informal dinner will be given which will be an ingathering of the Chicago engineers and delegates to the congress. The plans for the dinner are in charge of a committee representing the various engineering organizations in Chicago. W. D. Gerber, president of the Illinois Society of Engineers, is chairman; William M. Kinney, sub-division 63, engineers, Chicago Association of Commerce, is secretary. W. W. De Berard, representing sub-division 63; J. G. Giaver, representing the Illinois Society of Structural Engineers, and Philip N. Engel, representing the mechanical engineers, are the other members of the committee. Following the informal discussion at the evening meeting, the conference will continue the following day.

The plan to be discussed includes methods of strengthening and unifying the work of the national engineering societies in the advancement of engineering knowledge and practice and the maintenance of high professional standards; the invigorating of local societies adapted to local needs and exemplifying in their activities the principle of complete home rule; encouraging the adoption and enforcement by local engineering societies of codes of ethics in harmony with the standards used by the national organizations; the development of a scientifically planned and well conducted system of employment to be operated in co-operation by all engineering associations; the diffusing of information on engineering subjects or proper advertising of the profession as a whole; encouraging of local societies to devote time and thought to local, state and national affairs which influence engineering progress; the maintenance of a traveling secretary of the committee on co-operation to visit local bodies and to give personal advice and assistance in securing the highest efficiency and economy in administration.

Relieving Freight Congestion

In an endeavor to relieve freight congestion and lift the embargo on necessities, the American Railway Association, 75 Church Street, New York, has recommended to all railroads the opening of service to foodstuffs and containers, fuel, printing paper, agricultural implements, seed, fertilizer, etc. It has been successful in turning over cars from lines not affected to railroads which have found it necessary to adopt an embargo.

In the first two weeks of February a committee of the association reduced the total accumulations of freight cars in Gulf ports from 7327 to 6072. The situation at Columbus, Ohio, has been restored to normal. The Seaboard Air Line has arranged to turn over 1000 empty cars to the Louisville & Nashville, the Mobile & Ohio and the Nashville, Chattanooga & St. Louis railroads.

Reports dated Feb. 17 showed that 168,496 cars, loaded and empty, about 6¼ per cent of all the freight cars in this country, were being held for various reasons.

The Hamilton Iron Company is the name selected for the new company that has taken over the blast furnace at Hamilton, Ohio, formerly owned by the Miami Iron & Steel Company, as noted on page 577 of THE IRON AGE of March 1. The new company has been incorporated with a capital of $1,000,000, and is composed of John A. Savage, John A. Savage & Co., Duluth, Minn.; H. W. Croft, Harbison-Walker Refractories Company, Pittsburgh; T. L. Chadbourne, Jr., New York City; Harvey H. Brown, Stewart Iron Company, Cleveland, and L. C. Turley, Portsmouth, Ohio. It is likely the furnace will be blown in about May 1 on foundry iron, but later may run on Bessemer or basic.

VERY HIGH WAGES

Puddlers and Workers in Sheet Mills Get Sharp Advances

Extremely high wage rates were established by the bi-monthly sales sheet examination of the members of the Western Bar Iron Association and Independent Sheet and Tin Plate Manufacturers' Association made March 10 at Youngstown to determine the wages to be paid according to the agreement with the Amalgamated Association of Iron, Steel and Tin Workers. Bar iron was found to have been sold on an average of 2.35c., entitling puddlers to $11.30 a ton for March and April, an increase of $1 per ton above the rate that prevailed the first two months of this year. Bar-mill hands will be given a 10 per cent increase. These are the highest rates in the history of the manufacture of bar iron.

Sales of steel sheets Nos. 26, 27 and 28 gage were found to have averaged 3.40c. per lb., giving the sheet-mill workmen a net advance over the January-February prices of 18 per cent. As it was found that tin plate sold at an average price of $4.95 a box, these workmen will be granted an additional wage increase of 14 per cent and sheet mill workmen will receive this month and next a rate of 37½ per cent above the base fixed by the wage scale of 1916-1917. The wages of tin plate workmen in the union mills will be 19½ per cent above the base rate.

It is expected that in accordance with its custom the United States Steel Corporation and other companies not included in the agreement with the Amalgamated Association will grant a corresponding increase to their employees.

The Steel Corporation's Large Order Book

A new record in unfilled orders on the books of the United States Steel Corporation was disclosed by the statement for the month ended Feb. 28. The total was 11,576,697 tons, an increase of 102,643 tons over the unfilled orders on Jan. 31, 1917. The next largest total was 11,547,286 tons, on Dec. 31, 1916. A year ago the total was only 8,568,966 tons, and the unfilled orders this year at the close of February are not far from three times what they were on Feb. 28, 1915, when they were 4,345,371 tons. The following table gives the unfilled tonnage at the end of each month from January, 1914:

	1917	1916	1915	1914
January	11,474,054	7,922,767	4,248,571	4,613,680
February	11,576,697	8,568,966	4,345,371	5,026,440
March		9,331,001	4,255,749	4,653,825
April		9,829,551	4,162,244	4,277,068
May		9,937,798	4,264,598	3,998,160
June		9,640,458	4,678,196	4,032,857
July		9,593,592	4,928,540	4,158,589
August		9,660,357	4,908,445	4,213,331
September		9,522,584	5,317,618	2,787,667
October		10,015,260	6,165,452	3,461,097
November		11,058,542	7,189,489	3,324,592
December		11,547,286	7,806,220	3,836,643

Locomotive Orders

There have been orders for 183 locomotives in the last week. The Union Pacific has ordered 68 locomotives from the Baldwin Locomotive Works, which is in addition to the 16 which it ordered a week ago from the American Locomotive Company. The Philadelphia & Reading has ordered 25 locomotives from the Baldwin Locomotive Works and will build 20 in its own shops. The Baldwin Locomotive Works will also furnish the Atlantic Coast Line with 22 locomotives and the Nashville, Chattanooga & St. Louis with 10. The American Locomotive Company will build 5 Mikado locomotives for the Grand Trunk and the Canadian Government has ordered 20 locomotives from the Canadian Locomotive Company. It is estimated that up to March 10, inclusive, 1279 locomotives have been ordered this year. The Chicago & Northwestern is reported as about to inquire for 120 locomotives. The Southern Pacific is inquiring for 40 and the Chicago, Milwaukee & St. Paul will soon be in the market for several.

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The sixth annual report of the Studebaker Corporation, South Bend, Ind., covering the year 1916, shows net sales amounting to $61,988,594, from which was derived a profit of $8,611,245. After payment of the regular dividend on the preferred and 10 per cent on the common stock, $4,843,695 was added to the surplus account. The volume of regular business showed an increase of 37.71 per cent and net profits an increase of 51.39 per cent over the preceding year. The increase would have been greater had it not been for the car shortage handicap in the last quarter of the year. No war orders were sought or received in 1916.

Triple Supply Convention Program

The program of the American Supply & Machinery Manufacturers' Association, in connection with the joint triple convention of that body and the National Supply & Machinery Dealers' Association and the Southern Supply & Machinery Dealers' Association at Memphis, Tenn., April 12, 13 and 14, is announced.

The general arrangements of the convention are in the hands of a local committee, as follows: R. P. Towner, chairman, Towner & Co., Inc.; R. C. Beaver, N. O. Nelson Mfg. Company; L. C. Cato, E. C. Atkins & Co.; B. M. Gladding, E. C. Atkins & Co.; William Mayer, Simonds Mfg. Company; Frederick Orgill, Orgill Bros. & Co.; C. C. Reed, Reed & Duecker; J. A. Riechman, Riechman-Crosby Company; William Ross, Crane Company, and W. G. Thomas, Pidgeon-Thomas Iron Company.

The manufacturers and the dealers will be called to order at 10 a. m., Thursday, in an open joint session. At 2 p. m. the manufacturers begin an executive session, at which the address of President H. E. Dickerman, Chisholm-Moore Mfg. Company, Cleveland, will be given, various reports received, including that of Secretary-Treasurer F. D. Mitchell, and committees appointed.

On Friday morning a joint executive session of the three associations will be addressed by Lewis E. Pierson, Irving National Bank, New York, whose topic will be "Acceptances." At an executive session of the manufacturers, Friday afternoon, A. A. Ainsworth, New York, will give an address on "Some Results of Open Price Competition," action will be taken on resolutions submitted, and officers will be elected. On Saturday morning a meeting of the Executive Committee of the manufacturers will be held.

R. F. Valentine, Boston Woven Hose & Rubber Company, Boston, Mass., is chairman of the entertainment committee; Joseph V. Smith, Hubbard & Co., Pittsburgh, Pa., is chairman of the membership committee, and Charles L. Bowly, New Jersey Car Spring & Rubber Company, Jersey City, N. J., is chairman of the promotion committee.

Waste Material Dealers' Annual Meeting

The National Association of Waste Material Dealers will hold its annual meeting at the Hotel Astor, New York, Wednesday, March 21, beginning at 10 a.m. The fourth annual banquet of the association will be held at the same hotel at 7 p.m. The metal division, of which F. W. Reidenbach, Rochester, N. Y., is chairman, will hold its regular quarterly meeting on the afternoon of Tuesday, March 20, at 2:30. It is expected that the attendance at the meeting of this division will be large.

The nominating committee has reported the following list of officers to be balloted upon at the coming meeting: President, Louis Birkenstein; first vice-president, H. H. Cummings; second vice-president, James Rosenberg; third vice-president, Edward A. Stone; fourth vice-president, Henry Lissberger; fifth vice-president, Ivan Reitler; sixth vice-president, John Ryan; treasurer, Mark Sherwin; secretary, Charles M. Haskins, 185 Summer Street, Boston, Mass. Directors, James McMeel, Simon Weil, F. W. Reidenbach, Paul Loewenthal, William Lewin, N. J. Lewis, R. D. Cunningham, Daniel M. Hicks and Walter Oppenheimer.

Milwaukee Metal Trades Meeting

The Milwaukee Metal Trades and Founders' Association, at its annual meeting on March 9, chose Richard P. Tell, president and general manager National Brake & Electric Company, Milwaukee, as president. Mr. Tell succeeds William W. Coleman, president Bucyrus Company, South Milwaukee, who served two terms. John D. Bird, general manager Worthington Pump & Machinery Corporation, Cudahy, Wis., was elected vice-president. William J. Fairbairn, Milwaukee, was re-elected secretary and treasurer and manager of the Metal Trades and Founders' Bureau, University Building.

The guest of honor at the annual banquet, which was attended by more than 200, was Dr. Thomas Darlington, secretary welfare committee, American Iron and Steel Institute, New York, who delivered an address on "Better Working Conditions in Metal Industries," and complimented members of the association upon the splendid general welfare work now being done in their factories. The annual address of the retiring president, Mr. Coleman, urged continued support of the open-shop principle in metal-working industries. Clarence R. Falk, Falk Company, was re-elected a director representing the foundry section, and E. C. Bayerlain, Nordberg Mfg. Company, a director representing the machine-shop section, for three-year terms.

Chicago Metal Trades Meeting

The annual dinner of the Chicago Branch of the National Metal Trades Association was held March 6. James Keeley, Chicago *Herald*, gave the principal address. Other speakers were Dudley Taylor, Associated Employers of Illinois; H. D. Sayre, secretary National Metal Trades Association, and A. M. Larson, president Muskegon Manufacturers' Association. Detailed reports covered the work of the employment bureau, the employees' insurance, the co-operative course for shop apprentices in conjunction with Lewis Institute and the Superintendents' and Foremen's Club.

Officers were elected as follows: President, O. A. Olson, Simonds Mfg. Company; vice-president, Gustave A. Roth, Roth Brothers; treasurer, Wm. Ganschow, Wm. Ganschow Company; secretary, Paul Blatchford, 139 North Clark Street, all of Chicago. The executive committees include the president, vice-president, treasurer and the following: T. A. Jones, W. A. Jones Foundry & Machine Company; Charles N. Finkl, A. Finkl & Sons Company; C. D. McDonald, McDonald Machine Company; Prentice L. Coonley, Link-Belt Company; W. H. Strom, United States Ball Bearing Company; Carlton L. Elmes, C. F. Elmes Engineering Works, Chicago.

Cincinnati Sheet Metal Contractors' Banquet

The Cincinnati Association of Sheet Metal Contractors, Cincinnati, held its annual banquet at the Business Men's Club on the evening of March 8. President William F. Anspaugh presided. Among the speakers were John Weigel, president Cincinnati Hardware Guild; F. William Stechow, former president of the Cincinnati Sheet Metal Association; Charles E. Pfau, secretary Huenefeld Company; E. J. Becker, secretary Hardware Club of Cincinnati; W. F. Belmer, president Hardware Club of Cincinnati; Charles Kobmann and John A. Hengeller. A. H. Tuechter, president Cincinnati Bickford Tool Company, and director of the Business Men's Club, gave a talk at the club in which he said that the present high cost of all materials should bring about a closer co-operation among manufacturers, dealers and contractors.

Cleveland Metal Trades Meeting

At the annual meeting of the Cleveland Branch of the National Metal Trades Association, Cleveland, officers were elected as follows: President, A. W. Foote, Foote-Burt Company; vice-president, J. H. Hertner, R. & L. Baker Company; treasurer, J. D. Cox, Cleveland Twist Drill Company. Executive committee: W. D. Bartlett, Steel Products Company; P. A. Geier, P. A. Geier Company; Daniel Loew, Loew Mfg. Company, and H. H. Newsom, Standard Parts Company. M. F. McGovern, on March 1, became secretary of the Cleveland Branch, succeeding Philip Frankel, who recently resigned. The branch has moved its office to new quarters at 618 Guardian Building.

At the annual meeting of the Springfield Branch of the National Metal Trades Association, held at Springfield, Mass., March 9, H. Schellhammer, Bosch Magneto Company, was elected president; G. W. Kyburg, Package Machinery Company, vice-president; and L. J. Chandler, Chandler Company, treasurer. Executive Committee, L. E. Bartlett, Cheney-Bigelow Wire Works; F. P. Gagg, Rider-Bagg Company; Robert T. Lee, Clement Mfg. Company, Northampton; and C. E. Van Norman, Van Norman Machine Tool Company.

Central Iron & Steel Company Saved

It was announced at Harrisburg, Pa., March 8, that the Central Iron & Steel Company, which has been in the hands of receivers for some time, will be in a position to manage its own affairs shortly. The receivers are Charles L. Bailey, Jr., J. V. W. Reynders and James M. Cameron. Just before the advent of the present period of prosperity a movement had been planned by the stockholders to reorganize the company, float additional bonds and make a new attempt to operate the plant. Then the boom came and the need for a new organization disappeared, the demand for steel becoming so great that in a few months the net profits enabled the receivers to pay interest on the bonded debt that was long overdue and to meet all obligations as they came up. The company's affairs are now on a sound financial basis.

When the improvements and plant extensions now being made are completed, which will be by June 1, the plant will be equipped for materially increasing its output. A new open-hearth furnace, with a capacity for turning out 150 tons of steel a day, and which will be larger than any of the present furnaces, is being constructed, and it is also expected that improvements now being made to the two Paxton blast furnaces should be finished by the time stated. They have been out of operation for several years. Special effort is being made to install safety appliances and to train the employees in safety-first methods. Sanitary conditions are being improved and conveniences installed for the workmen.

New officers have been elected to take charge as soon as the receivers are withdrawn, as follows: Robert H. Irons, president; Francis J. Hall, vice-president; L. D. Perry, secretary and treasurer. Directors, Vance C. McCormick, Donald McCormick, James M. Cameron, Charles L. Bailey, Jr., and Edward Bailey.

Bids on Projectiles

WASHINGTON, March 13, 1917.—The Navy Department, on March 8, opened bids for a quantity of 14-in. high explosive projectiles, the number of shells not being made public under a recently adopted policy of the Department to treat as confidential certain information respecting purchases of war material. Six companies submitted bids as follows:

Crucible Steel Company at $285 per shell, deliveries to begin in 90 days; Bethlehem Steel Company, $290, 14 months; American Clay Machinery Company, Bucyrus, Ohio, $294.85, 8 months; Washington Steel & Ordnance Company, $320, 1 year; Midvale Steel Company, $325, 455 days; E. W. Bliss Company, $475, 8 months.

It is understood that the shells covered by these bids are very similar to the so-called common shell heretofore purchased for the navy, which differs materially from the armor-piercing projectile and which costs only about half as much. It is said that the Ordnance Bureau has developed a process by which the common shell can be converted at small expense into a high explosive projectile.

A British Columbia Steel Plant

The Aetna Iron & Steel Company, Ltd., has moved its offices from Victoria, B. C., to 916 Standard Bank Building, Vancouver, B. C. It has leased, with the option of purchase, the Port Moody Steel Works, situated about 12 miles from Vancouver. The present installation comprises two re-heating furnaces and a rolling mill with 12 and 21 in. trains. The company is rearranging the entire plant and has begun the construction of an open-hearth furnace, which it is hoped to have completed in about two months. Too many difficulties were encountered for the realization of the original intention of building a plant in Victoria. Joshua Kingham is president; David Milne, managing director, and S. M. Officer, secretary and treasurer.

Tin exports from the Federated Malay States in December, 1916, were 3945 tons, making the 1916 total 43,871 tons, as compared with 46,767 tons in 1915 and 49,042 tons in 1914. The January, 1917, exports were 3558 tons.

Foundrymen Hear Navy Yard Plans

Improvements to be made at the Philadelphia Navy Yard were the subject of discussion at a meeting of the Philadelphia Foundrymen's Association, March 7, at which the commandant of the yard, Capt. Robert L. Russell, and a number of officers were the guests. The specifications for a new foundry for the League Island yard have been sent to Washington. The meeting was held at the Manufacturers' Club, Philadelphia.

Capt. I. W. Shule said it is planned to construct a new 1000-ft. drydock, and in addition a 1000-ft. pier on which will be erected a 350-ton crane. The new drydock will have a depth of 43 ft., compared with 32 ft., the depth of the present one, and will enable care to be taken of the largest ships. The giant crane will require several thousand tons of structural steel, the contract for which already has been placed. It will enable easy handling of the largest guns, and will do the erecting of the turrets and the placing of armor plate.

Thomas Devlin, president of the association, referred to Philadelphia as the greatest foundry center of the world. Commander S. E. Morse and Capt. Gustave Kaemmerling described Government repair work and methods used in the Spanish-American War as compared with those used to-day. Representatives of David Lupton's Sons Company, Philadelphia; the Niles-Bement-Pond Company, New York, and the J. W. Paxon Company, Philadelphia, described some of their equipment applicable to navy yard use. J. S. Hibbs, J. W. Paxson Company, was toastmaster after the educational part of the program had been completed, and introduced the several officers who spoke on the League Island extensions.

Naval Consulting Board to Pass on Inventions for Defense

A special session of the Naval Consulting Board was held at the instance of Secretary of the Navy Daniels on the afternoon of March 10 in the Engineering Societies Building, New York, to consider urgent defense proposals. The Government has designated the board as the official body which will pass upon all inventions pertaining to national defense, for both army and navy.

The development of new methods for detecting enemy submarines and for the protection of surface craft from submarine attacks was the most pressing problem discussed. A new type of motor craft will have a thorough tryout, and, if successful, it is estimated as many as 2000 will be purchased. The following resolution was adopted:

> The Naval Consulting Board, at its meeting, held in New York on March 10, is unanimously of the opinion that a large fleet of light draft, high-speed motor boats, built preferably of wood, because of the opportunity which it gives for quick construction, and carrying guns, should be provided at the earliest possible moment for the protection of the coasts and harbors of the United States and vessels traveling thereon.

A large laboratory for special experiments, located "somewhere along the coast," is ready for use. Lawrence Addicks heads the laboratory board, with whom are associated Dr. W. R. Whitney, director research laboratory, General Electric Company, B. G. Lamme, Westinghouse Electric & Mfg. Company, Elmer E. Sperry and A. M. Hunt.

Thomas A. Edison has been elected president of the board for life. William L. Saunders, president Ingersoll-Rand Company, presided.

Renewal of the German Steel Syndicate

The renewal of the German Steel Works Union, provisionally for one year, was agreed upon at the last meeting. The present agreement, which would expire June 30, 1917, has been extended to June 30, 1918, subject to the coming in of one firm whose approval is regarded as certain. An attempt was made to secure an extension for a period of two years, but the opposition of the Thyssen company succeeded in influencing the decision in favor of the shorter term.

Iron and Steel Markets

PRICES STILL CLIMBING

Forward Buying of Pig Iron a Factor

Ship Shapes and Plates on a Parity—Further Price Advances Predicted

Times like these are without parallel in the iron and steel trade. Pig iron since January has been advancing in price by jumps and they have been frequently for two, three and four times the usual amounts. The advance in steel has been steady since the temporary halt in the middle of last year but the biggest increments have been made in the last few weeks.

If export demand may be seized on as substantially the main reason besides Government's needs for the later price increases, it is not yet certain that foreign buying will be checked. Large offerings in some forms of finished steel have been made at the new prices. Domestic purchasing meanwhile has not by comparison been of a large order, with some seasonal exceptions, but the advances have now had the effect of driving in many consumers for mill protection at prices below the new levels.

Thus far it is not clear that the pressure on the producers will be relieved. Certain it is that operating and sales departments are resisting vigorously a condition in which their hands are tied by commitments many months in the future.

The volume of forward buying in pig iron is particularly significant, in view of the prices involved. Whether the situation reflects the opinion of the consumer with regard to the length of the war or the effect of the participation of the United States in it must be left to conjecture.

Recent sales of basic iron have left a comparatively limited supply for further 1917 needs. A steel casting company in the St. Louis district bought 10,000 tons; another steel company bought 20,000 tons; some 40,000 tons was sold to an Eastern steel company, and upward of 40,000 tons is under inquiry for the East. A lot of 5000 tons was closed at $2 above last week's minimum. Foundry irons are generally $1 to $2 higher than a week ago. A Virginia interest after selling 10,000 tons at $31 for the first half of 1918 disposed of upward of 3000 tons for the same delivery at $32. For this year Virginia and Pennsylvania irons are now held at $36, and sales of Southern foundry iron have been put through at $30, Birmingham, for the last half. Bessemer iron commands $1 to $2 above last week's prices for the last half.

The advances in bars, shapes and plates by the Steel Corporation, forecasted last week, came sooner than expected and for much greater amounts. They may be taken in part as responsible for local sales which in a few cases have been the heaviest since December. It is an index of the strength of things to note that contract buying has been entered into in wire and wrought pipe at the new prices made in the preceding week. It is now predicted that in a few days an advance of $5 to $10 a ton will be made in bolts and nuts and a corresponding change in railroad spikes.

Shipbuilding is still the big factor. On the Atlantic coast 24,000 tons of steel ship material has been sold in the last few days for the last half of 1918 and the first quarter of 1919, and on the Pacific coast 30,000 tons. It is getting to be the practice to put ship shapes on a basis with ship plates and on some of this business for somewhat better than these deliveries 5c. has been the figure. Eastern plate mills have put up their quotations another notch, bringing ship plates to 7.50c. per lb. and ordinary tank quality to 6c. It is estimated that fully 100,000 tons of steel for shipbuilding purposes has been offered at present prices. The Cunard Line has covered for between 40 and 50 ships. Atlantic yards are being searched for space for 8 more boats.

Some 35,000 tons of rails have been sold. These include another 10,000-ton lot for Alaska, 5000 each for the Reading and the Virginian and 3000 for the Duluth, South Shore & Atlantic. For frog and switch work 10,000 tons have been bought. Two roads have covered for 25,000 tons of tie plates.

Railroad purchases have also been heavy in cars and locomotives. It is estimated that fully 50,000 tons have beer. covered for cars and some of the conspicuous locomotive purchases include 84 for the Union Pacific, 30 for the Rock Island and 25 for the Reading. The Chicago & Northwestern is inquiring for 120. The Southern Railway has bought 2000 cars and the Union Tank Line 2000.

Structural lettings in the East total over 10,000 tons; the Armour & Co. work at St. Paul will require 34,000 tons, including 4000 tons of bars, and two 8000-ton jobs have been driven in in the Pittsburgh territory by the late advances.

The recent contracting of the agricultural implement manufacturers, it is learned, was for their maximum requirements.

Pittsburgh

PITTSBURGH, PA., March 13, 1917.

The chief feature of the market in the past week was an advance of $15 per ton on plates and $7 per ton on steel bars and structural shapes made by the Carnegie Steel Company, effective from Friday, March 10. It is stated that that company will not be able to take advantage of the heavy advances being filled up on bars, plates and shapes for a year or more. Whenever the company can occasionally spare a small tonnage of these materials to a regular customer, due to change in rollings, deferred shipments to other customers or from some other cause, the new prices put its bars, shapes and plates at about the same levels as have been secured by outside mills for some time. It is likely, therefore, that mills in position to take orders for plates, shapes and bars will advance their prices on these products fully as much as the Carnegie Steel Company has done. Thus the immediate effect of one advance has been a general advance. There has also been a heavy movement in basic iron, with an advance in prices of $2 to $3 per ton. Bessemer has sold for last half at $37, and the whole pig-iron market, it is thought, will go higher. A

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Mar. 14, 1917.	Mar. 7, 1917.	Feb. 14, 1917.	Mar. 15, 1916.
No. 2 X, Philadelphia...	**$36.50**	$34.75	$31.50	$20.00
No. 2, Valley furnace....	36.00	36.00	33.00	18.50
No. 2 Southern, Cin'ti...	**31.90**	29.90	26.90	17.90
No. 2, Birmingham, Ala.	**29.00**	27.00	24.00	15.00
No. 2, furnace, Chicago*	**35.00**	34.00	32.00	18.50
Basic, del'd, eastern Pa..	**33.50**	30.50	30.50	19.50
Basic, Valley furnace....	**32.00**	30.00	30.00	18.25
Bessemer, Pittsburgh....	36.95	36.95	35.95	21.95
Malleable Bess., Ch'go*.	**35.00**	34.00	32.00	19.50
Gray forge, Pittsburgh..	**32.95**	31.95	31.95	18.45
L. S. charcoal, Chicago..	**36.75**	35.75	33.75	19.75

Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	38.00	38.00	38.00	28.00
O.-h. rails, heavy, at mill	40.00	40.00	40.00	30.00
Bess. billets, Pittsburgh.	65.00	65.00	65.00	45.00
O.-h. billets, Pittsburgh.	65.00	65.00	65.00	45.00
O.-h. sheet bars, P'gh...	65.00	65.00	65.00	45.00
Forging billets, base, P'gh	90.00	90.00	85.00	65.00
O.-h. billets, Phila.....	65.00	65.00	60.00	50.00
Wire rods, Pittsburgh....	80.00	80.00	75.00	55.00

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	**3.659**	3.409	3.159	2.559
Iron bars, Pittsburgh....	3.50	3.50	3.25	2.40
Iron bars, Chicago.....	3.00	3.00	3.00	2.15
Steel bars, Pittsburgh....	**3.75**	3.25	3.25	2.75
Steel bars, New York....	**3.919**	3.419	3.419	2.919
Tank plates, Pittsburgh..	**5.25**	5.00	4.75	3.00
Tank plates, New York..	**5.419**	5.169	4.919	3.419
Beams, etc., Pittsburgh..	**3.40**	3.25	3.25	2.50
Beams, etc., New York..	**3.569**	3.419	3.419	2.619
Skelp, grooved steel, P'gh	3.50	3.50	3.25	2.20
Skelp, sheared steel, P'gh.	3.75	3.75	3.50	2.30
Steel hoops, Pittsburgh..	**4.00**	3.75	3.50	2.75

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Mar. 14, 1917. Cents.	Mar. 7, 1917. Cents.	Feb. 14, 1917. Cents.	Mar. 15, 1916. Cents.
Sheets, black, No. 28, P'gh	**5.00**	4.75	4.75	2.75
Sheets, galv., No. 28, P'gh	**7.00**	6.75	6.50	4.75
Wire nails, Pittsburgh...	3.20	3.20	3.00	2.40
Cut nails, Pittsburgh....	3.70	3.70	3.70	2.30
Fence wire, base, P'gh..	3.15	3.15	2.95	2.25
Barb wire, galv., P'gh...	4.05	4.05	3.85	3.25

Old Material, Per Gross Ton:				
Iron rails, Chicago.....	**$28.00**	$27.00	$27.00	$18.00
Iron rails, Philadelphia.	28.00	28.00	28.00	20.00
Carwheels, Chicago.....	**20.25**	20.00	18.00	14.50
Carwheels, Philadelphia..	**21.00**	20.50	20.50	16.50
Heavy steel scrap, P'gh..	22.00	22.00	22.00	19.00
Heavy steel scrap, Phila..	**23.50**	22.00	20.00	17.00
Heavy steel scrap, Ch'go	**24.00**	22.75	21.75	16.75
No. 1 cast, Pittsburgh...	20.00	20.00	19.00	16.00
No. 1 cast, Philadelphia.	**21.00**	20.00	20.00	17.00
No. 1 cast, Ch'go (net ton)	16.50	16.50	15.00	13.50
No. 1 RR. wrot, Phila....	**30.00**	29.00	25.00	22.00
No. 1 RR. wrot, Ch'go (net)	**26.00**	25.00	24.00	16.00

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	**$9.50**	$10.00	$10.00	$3.35
Furnace coke, future....	7.00	7.00	7.00	3.00
Foundry coke, prompt...	*11.00*	12.00	11.00	3.75
Foundry coke, future....	7.50	7.50	8.00	3.50

Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York..	*36.00*	36.25	34.50	27.00
Electrolytic copper, N. Y.	*36.00*	36.25	34.50	26.37½
Spelter, St. Louis.....	*10.50*	10.62½	10.50	16.50
Spelter, New York.....	*10.75*	10.87½	10.75	16.75
Lead, St. Louis.....	9.50	9.50	8.90	7.37½
Lead, New York.....	9.50	9.50	9.00	7.25
Tin, New York.....	*53.50*	54.00	53.00	54.00
Antimony (Asiatic), N. Y.	**31.00**	30.00	30.00	44.00
Tin plate, 100-lb. box, P'gh.	$8.00	$8.00	$7.50	$4.25

number of large consumers have found they need iron and have rushed to cover. Mills and consumers alike are figuring that the Government will be a heavy preferred purchaser, and will intensify the demand for iron and steel. The recent advances in prices on pipe, wire products and other finished steel are holding firm, and contracts for delivery in the last half of the year have been made on the products that were advanced, and at the new full prices. The car supply is slowly getting better. The Carnegie Steel Company reports that it reduced accumulated stocks awaiting shipment fully 5000 tons in the past week. Coke has been moving more freely, and prices on prompt furnace and foundry are lower. At this writing the Carnegie Steel Company has 12 blast furnaces idle, and only three banked for lack of coke, 44 being in blast. There is a stronger tone in the scrap market, due to the higher prices on basic iron, and it is believed heavy steel scrap and other grades used in open-hearth steel plants are about due for an advance. There has been a fairly heavy movement in low-phosphorus melting stock on the basis of about $32, delivered.

Pig Iron.—There has been a spectacular advance in prices of basic iron, due to a limited supply and to a sudden heavy demand from consumers outside the Pittsburgh district. The heavy purchases from these sources have cleaned up a good deal of the available supply. The Commonwealth Steel Company, St. Louis, bought 10,000 tons of basic iron at $31, at furnace; another consumer has taken about 20,000 tons at the same price for last half of the year delivery and there are inquiries in the market for 40,000 to 50,000 tons of basic from Eastern steel works. An open-hearth plant in the Cincinnati district has not yet been satisfied. After the heavy sales of basic at $31 at furnace there were smaller sales at $32, one of 5000 tons being reported at this price, while a few small lots are said to have brought $32, Valley furnace. One leading producer of basic iron is practically sold up for the next six months and is quoting only on very small lots. There has been some movement in Bessemer iron at $36 to $37 at furnace, the higher price having been paid for small lots. A fairly heavy inquiry is on for foundry iron for last half of the year and some sales have been made at $36 to $37 at furnace. The whole pig iron market is very strong and predictions are that prices will be much higher in the near future. We now quote standard Bessemer iron at $36 to $37; basic, $32 to $33; gray forge, $32 to $33; malleable Bessemer, $32 to $34; and No. 2 foundry, $36 to $37, all at Valley furnace, the freight rate to the Pittsburgh and Cleveland districts being 95c. per ton.

Billets and Sheet Bars.—It is not found here that any large lots of billets or sheet bars have been offered for resale or that the available supply of steel is any larger, or prices lower, than they have been for several months. Sales are reported of 1200 tons and of 1500 tons of sheet bars at $65, f.o.b. Pittsburgh, for delivery to a Youngstown plant to be rolled into sheets, the buyer operating its own open-hearth steel plant largely on shell steel for the Entente Allies. There have also been several small sales of forging billets at $90, or above, Pittsburgh. It is not unlikely that the new demand for high-carbon billets for export will fall off considerably, and domestic consumers that have been buying shell steel have pretty well cleaned up their contracts for shells, so that the outlook is the supply of soft Bessemer and open-hearth steel for regular purposes will be larger in the near future than it is now. We quote soft Bessemer and open-hearth billets and sheet bars at $65 to $70 per ton, maker's mill, Pittsburgh or Youngstown; forging billets, $90 to $95 for sizes up to but not including 10 x 10 in., and for carbons up to 0.25.

Ferroalloys.—There is quite an active demand for ferromanganese for prompt shipment, and prices are firm. We note one sale of 50 tons at $285, and another sale of 50 tons at $300, f.o.b. Pittsburgh, for April and May delivery. It is probable that for third and fourth quarter shipment domestic 80 per cent ferromanganese could be bought at $250 to $275 at maker's furnace. The price on English 80 per cent remains at $185, seaboard, for last-half delivery, but some sellers have withdrawn from the market and are refusing to quote. There is no increase in the supply of ferrosilicon, 50

per cent having sold in small lots at $225 to $250 per ton for prompt shipment. We continue to quote domestic 80 per cent ferromanganese for prompt shipment at $285 to $300 per ton at furnace, while English 80 per cent is still quoted by a few sellers at $185 for last half of the year, but with no guarantee as to deliveries. We quote 18 to 22 per cent spiegeleisen at $65 to $70, and 25 to 30 per cent at $75 to $85, delivered. We quote 9 per cent Bessemer ferrosilicon at $45 to $46; 10 per cent, $46 to $47; 11 per cent, $47 to $48; 12 per cent, $48 to $49; 13 per cent, $49.50 to $50.50; 14 per cent, $52; 15 per cent, $54, and 16 per cent, $56. We quote 7 per cent silvery iron at $42 to $45; 8 per cent, $43 to $46; 9 per cent, $44 to $47; 10 per cent, $45 to $48; 11 and 12 per cent, $46 to $49, all f.o.b. at furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of $2 per gross ton for delivery in the Pittsburgh district.

Structural Material.—Effective from Friday, March 10, the Carnegie Steel Company advanced its price on structural shapes $7 per ton, or from 3.25c. to 3.60c. at mill, but with no definite promise of delivery. Other makers quickly followed this advance, so that the minimum to-day on beams and channels is 3.60c., with one or two makers quoting 3.75c. or higher for delivery in third and fourth quarters. No large jobs have lately been placed in this district, but the heavy advance in prices has resulted in a number of jobs that were held up being placed at prices quoted by fabricators some time ago. Two jobs of about 8000 tons are included in these, but the details are not yet ready to give out. We quote beams and channels up to 15-in. at 3.60c. to 3.75c., while small lots from warehouse are quoted at 4.25c. to 5c., depending on quantity.

Plates.—Effective from Friday, March 10, the Carnegie Steel Company advanced its price on sheared plates from 3.75c. to 4.50c. or $15 per ton. This is the heaviest advance in prices on plates ever made at one time in the history of the trade. For several months outside plate mills have been getting from 4.50c. to 6c. for sheared plates, and the Carnegie Company figured that it might as well put its price on plates on a par with what was being quoted and obtained by other mills. It is reported filled on plates for a year or more, but no doubt can occasionally work in an order from a regular customer for which he will have to pay at least 4.50c. at mill. New orders for cars are scarce. The two local steel car companies report they have pretty well cleaned up orders on their books for munitions for the Entente Allies, and are now arranging with the mills to replace with plates and bars any unshipped high-carbon steel which they will not need. The Pressed Steel Car Company has taken an order for 250 steel gondola cars for the Great Northern. The Reading is in the market for 2000 cars, the Seaboard Air Line for the same number, and the Union Tank Line is reported to have placed 1250 steel tank cars with Western builders. Ship plates are quoted from 6c. to 7c. per lb. at mill, and predictions are made that ordinary tank plates will sell prior to Aug. 1 at $200 per ton, or 10c. per lb. We now quote ¼-in. and heavier sheared plates at 4.50c. at mill for indefinite delivery, 4.75c. to 5.25c. for fairly prompt shipment, and from 5.50c. to 6c. per lb. in small lots.

Steel Rails.—Of the order for steel rails placed by the Pennsylvania Railroad, the Steel Corporation was awarded 30,066 tons, nearly all 125-lb., about half of which will be rolled at the Edgar Thomson works of the Carnegie Company for the Lines East, and the other half by the Illinois Steel Company at Chicago for the Lines West. Few orders for standard sections are being placed, but the new demand for light rails from the coal-mining interests is quite heavy, running 4000 to 5000 tons per week. We quote light rails as follows: 25 to 45 lb., $55; 16 to 20 lb., $56; 12 and 14 lb., $57; 8 and 10 lb., $58; in carload lots, f.o.b. mill, with the usual extras for less than carloads. Standard section rails of Bessemer stock are held at $38 and open-hearth $40, per gross ton, Pittsburgh.

Sheets.—The new demand is fairly heavy, most consumers being covered up to July, and are specifying quite freely against contracts. The output of sheets so far in March shows a large increase over the same period in February, but there is still a shortage in cars, and large quantities of sheets are piled up in warehouses awaiting shipment. There is an active export demand from China, Japan, Italy and France. Prices are very firm, sales of No. 28 Bessemer black for fairly prompt delivery having been made at as high as 5.50c. at mill. We quote blue annealed sheets, Nos. 3 to 8, at 5c. to 5.25c.; box annealed, one pass, Bessemer cold-rolled, No. 28, 5c. to 5.50c.; No. 28 galvanized, 6.75c. to 7.50c.; No. 28 black plate, tin-mill sizes, 4.75c. to 5c., all f.o.b. mill, Pittsburgh. These prices are for carloads and larger lots for shipment over the next three or four months. Mills that can ship out in four to six weeks readily get premiums over these prices.

Tin Plate.—The new demand is heavy, and specifications are very active. Two inquiries are in the market for about 150,000 to 175,000 boxes for Italy, and the Italian Government has guaranteed the boats to take the boxes over, but so far none of this business has been placed, domestic mills not being able to take care of it. On current orders for primes and wasters, prices range from $7.50 to $8 per base box. On current orders we quote $7.50 to $8 per base box at mill. We quote long-terne plate, No. 28 gage base, at $7 to $7.50; short-terne plate, $11.50 to $12.50, maker's mill.

Shafting.—The 20 per cent discount has practically disappeared, and is being made only to a very few of the largest trade. Most consumers are covered to July, and in a few cases for a later period. Specifications are active, especially from the automobile and the screw stock machine people. Some makers can ship out in from 10 to 12 weeks from date of order. We quote cold-rolled shafting at 20 to 15 per cent off list in carloads and larger lots, and 5 to 10 per cent off in less than carload lots for second quarter, f.o.b. Pittsburgh, freight added to point of delivery. A prominent shafting company, effective March 15, has advanced its prices on carloads and contracts for cold-rolled shafting to 5 per cent off list, f.o.b. cars, Pittsburgh, these prices to govern sales for second-quarter delivery only. With the recent advance in steel bars it is stated to be absolutely necessary to advance prices on steel shafting and kindred products.

Railroad Spikes and Track Bolts.—It is expected that this week prices on railroad spikes will be advanced 25c. per keg, or from $3.40 to $3.65 base, f.o.b. at mill. This is already under way, and will be made on account of the higher prices being quoted for other finished steel products. The demand for railroad spikes is only fair, but specifications against contracts are coming in at a good rate. There is also a fair demand for track bolts, and prices are certain to advance in the near future. We quote track bolts with square nuts at 4.85c. to 5c. to railroads and 5c. to 5.25c. in small lots to jobbers, base. Railroad spikes, 9/16 in. and larger, $3.40, base; 7/16 and ½ in., $3.50, base; 5/16 and ⅜ in., $3.75, base. Boat spikes, $3.65, base, all per 100 lb., f.o.b. Pittsburgh.

Wire Products.—Makers report the recent advance firmly held; in fact, contracts for wire nails have been made on the new basis of $3.20 base per keg, and also for wire at the new prices. Mills are well sold up for the next three or four months, and, with the heavy demand, it would not be surprising if prices on both nails and wire further advance. There is still a large export demand for wire nails and barb wire, and if the mills were in position to quote on this business, they would obtain higher than domestic prices. We quote: Wire nails, $3.20 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2.20, and shorter than 1 in. $2.70. Bright basic wire is $3.25 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.15; galvanized wire, $3.85; galvanized barb wire and fence staples, $4.05; painted barb wire, $3.35; polished fence staples, $3.35; cement-coated nails, $3.10, base, these prices being subject to the usual advances for the smaller trade, all f.o.b Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 51 per

cent off list for carload lots, 50 per cent off for 1000-rod lots, and 49 per cent off for small lots, f.o.b. Pittsburgh.

Wire Rods.—Several weeks ago there were sales of soft Bessemer and open-hearth rods at $80 per gross ton at maker's mill, and recently one lot of 500 tons of soft open-hearth rods was sold at $85. There is an insistent heavy demand, but most makers are selling only a few rods, needing almost their entire output for their own wire mills. There is a strong export inquiry, but most of this is being turned down as domestic makers cannot spare the rods. We quote soft Bessemer, open-hearth and chain rods at $80 to $85 per gross ton, and high-carbon rods from $90 to $125 per gross ton at mill, prices on the latter depending entirely on quality.

Iron and Steel Bars.—Effective from Friday, March 10, the Carnegie Steel Company advanced its price on steel bars and bands from 3c. to 3.35c. at mill, or $7 per ton, but with no promise of delivery. Recently large implement makers closed for their needs of steel bars for the last half of the year at 2.90c. to 3c. at mill, and this advance is taken to indicate that any consumers not under cover will have to pay much higher prices. For some time steel bars for fairly prompt shipment have been bringing 3.25c. to 3.50c. at mill. We now quote steel bars at 3.35c. at mill, with no promise of definite delivery, and 3.50c. to 3.75c. for shipment in two to three months. We quote refined iron bars at 3.50c. and railroad test bars 3.65c. at mill in carload lots.

Cold-Rolled Strip Steel.—Makers report the current demand active. Most large consumers, however, are covered to July 1 and are now importuning the mills to take their contracts for last-half delivery. None will yet sell beyond July 1, as the outlook is that prices will be higher. For second-quarter delivery we quote cold-rolled strip steel at $7.50 to $8 per 100 lb. On current orders mills are getting from $8 to $8.50 per 100 lb. Terms are 30 days net, less 2 per cent for cash in 10 days, delivered in quantities of 300 lb. or more when specified for at one time.

Nuts and Bolts.—It is likely that in a few days an advance of $5 to $10 per ton will be announced. Makers say the new demand has been very heavy for the past three or four weeks, consumers desiring to cover their needs not only for the second quarter, but over the last half of the year. As yet makers are not inclined to sell for delivery beyond July 1, as they do not know what their steel will then cost. The export demand is also large. One local concern recently made a shipment of several carloads abroad. Discounts in effect at this writing are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days:

Carriage bolts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 and 2½ per cent; large, 30 and 5 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 50 per cent; small, cut thread, 40 and 10 per cent; large, 35 and 5 per cent.

Machine bolts, c. p. c. and t. nuts, small, 40 per cent; large, 30 per cent. Bolt ends, h. p. nuts, 35 and 5 per cent; with c. p. nuts, 30 per cent. Lag screws (cone or gimlet point), 50 per cent.

Nuts h. p. sq. and hex., blank, $2.50 off list, and tapped, $2.30 off; nuts, c. p. c. and t. sq., blank, $2.10 off, and tapped, $1.90 off; hex., blank, $2.25 off, and tapped $2 off. Semi-finished hex. nuts, 50, 10 and 5 per cent. Finished and case-hardened nuts, 50, 10 and 5 per cent.

Rivets 7/16 in. in diameter and smaller, 40 and 10 per cent.

Rivets.—Last week there was an advance of $10 per ton on structural and boiler rivets. Makers continue to report the new demand active. The export demand is also strong. Makers now quote buttonhead structural rivets, ½-in. in diameter and larger, $4.75 per 100 lb., base, and conehead boiler rivets, same sizes, $4.85 per 100 lb., base, f.o.b. Pittsburgh. Terms are 30 days net, or ½ of 1 per cent off for cash in 10 days.

Hoops and Bands.—Last week the Carnegie Steel Company put its price on steel bands at 3.35c., an advance of $7 per ton, but with no definite promise of delivery. Other makers that can ship out in three to four months are quoting as high as 3.50c., and in some cases 3.75c., with extras as per the steel-bar card. Prices on hoops range from 4c. to 4.25c. at mill.

Wrought Pipe.—In connection with the recent advance of $4 per ton on black and galvanized iron and steel pipe, it develops that discounts on conduit pipe were lowered four points at the same time, equal to an advance of $8 per ton. The new demand for pipe and oil-country goods is very heavy, and the mills are sold so far ahead they cannot take on much new business for delivery before late this year. This will probably defer the placing of quite a number of large orders for line pipe for gas and oil projects, which otherwise would have been put through this year. There are active inquiries now in the market for 150 to 200 miles of 4-in. and 6-in. line pipe, but with small prospect of developing into orders. On butt-weld sizes of pipe, mills can make delivery in eight to ten weeks. Discounts in effect from March 5 are given on another page.

Boiler Tubes.—None of the local makers is quoting on new orders for boiler tubes, either in iron or steel, being sold up for all of this year and some into early 1918. Discounts on tubes have not been officially changed since Nov. 1, 1916, but these are purely nominal, any orders for either iron or steel tubes being placed at much higher prices than the printed discounts indicate. On seamless steel tubing the two local makers are practically filled up to July 1, 1918. Nominal discounts on iron and steel tubes are given on another page.

Old Materials.—The local demand is still inactive, the market in this respect being much better in the valleys and in the Cleveland and Canton, Ohio, districts. Local consumers are well stocked, and embargoes are on for scrap routed to the Jones & Laughlin Steel Company's mills in this city and to the Pittsburgh Steel Company at Monessen, Pa. The car supply is better, and dealers believe that when the two embargoes are removed prices will be better and the demand greater. Last week there were some fairly large sales of low-phosphorus melting stock at about $32 per gross ton, delivered to buyers' mills, and also sales of turnings at about $11.50, and borings, $11.75, delivered. Prices on heavy steel scrap are firmer and slightly higher, due no doubt to the higher market on basic iron, which sold on Monday, March 12, at $32 per ton, Valley furnace. There have been re-sales of heavy steel scrap between dealers at $21.50 and $22 per gross ton. Prices for delivery in Pittsburgh and at other consuming points that take Pittsburgh freight rates, per gross ton, are as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh, delivered	$22.00 to $23.00
No. 1 foundry cast	20.00 to 20.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	27.00 to 28.00
Hydraulic compressed sheet scrap	18.00 to 18.50
Bundled sheet scrap, sides and ends, f.o.b. consumers' mills, Pittsburgh district	15.50 to 16.00
Bundled sheet stamping scrap	15.00 to 15.50
No. 1 railroad malleable stock	19.00 to 19.50
Railroad grate bars	12.50 to 13.00
Low-phosphorus melting stock	32.00 to 32.50
Iron car axles	41.00 to 42.00
Steel car axles	45.00 to 46.00
Locomotive axles, steel	48.00 to 49.00
No. 1 busheling scrap	18.50 to 19.00
Machine-shop turnings	11.50 to 11.75
Old carwheels	20.50 to 21.00
Cast-iron borings	11.75 to 12.00
*Sheet bar crop ends	25.00 to 26.00
No. 1 railroad wrought scrap	24.50 to 25.00
Heavy steel axle turnings	15.50 to 16.00
Heavy breakable cast scrap	19.00 to 19.50

*Shipping point.

Coke.—The supply of cars was fairly good last week, and coke was moved quite promptly, resulting in prompt furnace declining to $9 per net ton at oven, at which price fairly large quantities were sold on Saturday, March 10. However, at the first of the week the market was stronger, and best grades of prompt furnace coke were held at $9.50 to $10 at oven. Prices on 72-hr. foundry coke for prompt delivery are lower, ranging from $12 to $13 per net ton at oven. We now quote best grades of prompt furnace coke at $9.50 to $10 and prompt 72-hr. foundry coke at about $12 per net ton

at oven. The Connellsville *Courier* gives the output of coke in the upper and lower Connellsville regions for the week ended March 3 as 346,463 net tons, a decrease over the previous week of 6998 tons.

Chicago

CHICAGO, ILL., March 13, 1917.

Last week brought another flood of higher prices and with it the closing of many pending orders on which price protection was expiring. In the matter of sales it was one of the heaviest since December. Buying of tie-plates by the railroads and of structural steel was particularly prominent. One of the Southern route transcontinental lines bought 20,000 tons of tie-plates, while another bought 5000 tons, immediatedly preceding an advance of $5 per ton. The packing plant project of Armour & Co. at St. Paul has now been expanded to a requirement of 30,000 tons of structural and 4000 tons of rail-carbon bar steel, while miscellaneous contracts, including one of 3900 tons placed by the United Verde Extension Mining Company, totaled about 8000 tons. Locomotive buying in the West was also on a liberal scale. The changes in prices include, in addition to tie-plates, $2 per ton on spikes and bolts, $7 per ton for structural steel and steel bars, $15 per ton for plates, from $1 to $3 per ton on pig iron and from 50c. to $1.50 per ton on various grades of scrap. The rail-carbon bar mills are now practically on the basis of 3.25c., an advance of $5 per ton, and an announcement of new bolt discounts this week would not be surprising. Pig-iron sales since March 1 have been fairly large, a leading Northern interest having disposed of approximately 35,000 tons, while iron available for prompt shipment is taken as soon as offered. Buying of steel scrap and carwheels was on a decidedly larger scale. Store prices have been advanced in step with the new mill quotations, not only for standard products, but for most of the special materials, which are from $5 to $10 per ton higher.

Pig Iron.—The situation so far as it concerns prompt delivery iron and coke continues almost a scramble. An offering of 1000 tons of Northern iron for prompt delivery was disposed of in two lots of 300 and 700 tons within a few hours after becoming available, and a tonnage of Southern iron, in transit, was oversold on a circular-letter solicitation. On the other hand, the inquiry for 3600 tons for an Indiana malleable foundry for forward delivery is understood to have been temporarily withdrawn. The inquiry of the Commonwealth Steel Company for from 10,000 to 15,000 tons of basic iron, which brought from this market a minimum quotation of $34 at the furnace disclosed the relatively low price of basic iron in the valleys of $30 to $31, and it is understood that the business was placed there with a large steel company not regularly marketing iron. The Southern market has advanced sharply to a minimum of $30 at Birmingham, at which price some sales have been made, while some of the producers are asking $31. As against the firm position of the furnaces in the South for last-half iron, for which period the above prices rule, quotations on inquiry for the first half of 1918 are not well defined. There is reason to believe that much lower prices would be named for that delivery, $25 or $26 not being unlikely. Two of the largest charcoal iron interests have put their minimum price at $37 at the furnace, with quotations for higher silicon grades at a minimum of $38.50. Other charcoal iron quotations are still obtainable, however, equivalent to $35 at the furnace, and business was taken last week at $34. Prompt delivery silvery irons from Ohio are offered at $46.50, Chicago, as against $42.50 for future delivery. Local strong foundry iron and malleable Bessemer are now quoted at $35 f.o. b. furnace. The broadening of the local market which had been anticipated with the completion of the Inland Steel Company's third furnace, now ready to blow in, is now contingent upon such delays as seem likely to be caused by shortage of coking coal. For Lake Superior charcoal iron we quote delivery prices at Chicago to include a freight rate of $1.75. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton.

Lake Superior charcoal, Nos. 2 to 5	$36.75 to $38.75
Lake Superior charcoal, No. 1	37.25 to 39.25
Lake Superior charcoal, No. 6 and Scotch	37.75 to 40.25
Northern coke foundry, No. 1	35.50
Northern coke foundry, No. 2	35.00
Northern coke foundry, No. 3	34.50
Northern high phosphorus foundry	34.00
Southern coke No. 1 f'dry and 1 soft	35.00 to 35.50
Southern coke No. 2 f'dry and 2 soft	34.00 to 35.00
Malleable Bessemer	35.00
Basic	34.00 to 34.50
Low phosphorus	58.00 to 59.00
Silvery, 8 per cent	42.50 to 46.50
Bessemer ferrosilicon, 10 per cent	50.00

Rails and Track Supplies.—It seems unlikely that any considerable portion of the Pennsylvania rails will be rolled at Chicago, since quotations can be had here only for third quarter delivery in 1918, the reservations for the Pennsylvania rails at one time in effect having been released when that road decided not to buy some time ago. Local sales last week totaled about 30,000 tons, in which was included the second 10,000 tons for the Alaskan Commission and 10,000 tons for a manufacturer of frogs and switches. The negotiations of one of the transcontinental lines for 14,000 tons of tie plates mentioned some time ago were closed on the basis of a purchase of 20,000 tons; the Burlington bought 5000 tons, another road 1000 tons. With some smaller lots aggregate purchases ran up to about 28,000 tons. The price was advanced from $55 to $60 per ton. Advances of $2 per ton on spikes and bolts were also put into effect. Quotations are as follows: Standard railroad spikes, 3.60c. to 3.70c., base; track bolts with square nuts, 4.60c. to 4.70c., base, all in carloads, Chicago; tie-plates, $60, f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base; open-hearth, $40; light rails, 25 to 45 lb., $52; 16 to 20 lb., $53; 12 lb., $54; 8 lb., $55; angle bars, 2.25c.

Structural Material.—Contracts for fabricated steel let last week included 322 tons for the Montana Power Company; 374 tons for an office building at Spokane, Wash.; 215 tons for the Foster Machine Company's shop at Elkhart, Ind., taken by the Elkhart Bridge Company; 1200 tons for the Garfield Smelting Company, Garfield, Utah, taken by the Kansas City Structural Steel Company; 577 tons additional material for the Chicago & Northwestern Railway Company's machine shop at Chicago, taken by A. Bolter's Sons Company; 3900 tons for the United Verde Extension Mining Company's smelting plant at Jerome, Ariz., taken by the Kansas City Structural Steel Company; 510 tons for the Minneapolis, St. Paul & Sault Ste. Marie Railway Company, and 392 tons for a store building at Denver, Col. The division of the 20,000 tons of Bethlehem shapes for Armour & Co.'s St. Paul plant between the Hansell-Elcock Company and American Bridge Company, previously mentioned, now involves a total of 30,000 tons. Buying of locomotives in the past several days includes 68 for the Union Pacific, 30 for the Rock Island and 5 for the Belt Railway of Chicago. New car orders include 250 box cars placed with the Mount Vernon Car & Mfg. Company by the Norfolk & Southern, and 250 gondolas for the Great Northern, awarded to the Pressed Steel Car Company, while inquiry is in the market for 500 gondolas from the Pere Marquette, 200 tank cars for the Burlington and 100 miscellaneous cars for the Duluth & Iron Range. The price of structural steel has been advanced $7 per ton and we quote for Chicago delivery of plain material from mill 3.789c.

We quote for Chicago delivery of structural steel out of jobbers' stocks, 4.25c.

Plates.—It is commonly reported that inquiry from Japan seeks the placing of a large tonnage of plates for delivery during the next two years on a basis of 4c., Pittsburgh. The unparalleled advance of $15 per ton in the price of plates establishes another record-breaking high point in prices. The sources of supply from which plates can be secured is gradually narrowing down both in number and in the range of sizes available. We quote for Chicago delivery of plates from mill, at its convenience, 4.689c.; for prompt shipment, in widths up to 72 in., 5.189c. to 5.689c.; and

for wide plates, 5.689c. to 6.19c., depending upon deliveries.

We quote for Chicago delivery of plates out of jobbers' stocks, 5.50c.

Sheets.—The leading interest has not yet announced new prices for sheets, nor has it regularly opened its books for second half delivery and the trade is anticipating with marked interest the action that will be taken. Prices being made by independent interests put the minimum for blue annealed sheets at 4.75c., though most of the quotations are $5 per ton higher. Black sheets range from 5c. to 5.25c., and for galvanized sheets prices vary within exceptionally wide limits. The supply of blue annealed sheets is especially scarce and each succeeding week sees some mill withdraw from the market. We quote for Chicago delivery, No. 10 blue annealed, 4.75c. to 5c.; box annealed, No. 16 and lighter, 5c. to 5.25c.; No. 28 galvanized, 6.75c. to 7.50c. These quotations are minimum prices for contracts. Early shipment quotations are $5 to $10 per ton higher.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 5.50c.; No. 28 black, 5.65c.; No. 28 galvanized, 7.75c.

Bars.—Following the advance of $7 per ton in the price of mild steel bars, the makers of high-carbon bars have gone to a basis of 3.25c. at the mill for all ordinary business and bar-iron manufacturers, while still selling at $3, are crowding their quotations upward wherever possible. The requirement of 4000 tons of reinforcing bars for the St. Paul plant of Armour & Company is the largest single item in the market. We quote mill shipment, Chicago, as follows: Bar iron, 3c. to 3.25c.; soft steel bars, 3.539c. to 3.689c.; hard steel bars, 3c. to 3.25c.; shafting, in carloads, 20 per cent off, less than carloads, 15 per cent off.

We now quote store prices for Chicago delivery as follows: Soft steel bars, 4c.; bar iron, 4c.; reinforcing bars, 4c., base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent.

Rivets and Bolts.—Users of bolts and nuts having new contracts under negotiation or in prospect are being advised of a probable further advance in prices to come at once, and it seems certain that the increase in the price of bars and rods will be promptly followed by a cut in the prevailing discounts. A similar course seems likely with respect to rivets. We quote as follows: Carriage bolts up to ⅜ x 6 in., rolled thread, 40-10; cut thread, 40-2½; larger sizes, 30-5; machine bolts up to ⅜ x 4 in., rolled thread, with hot pressed square nuts, 50; cut thread, 40-10; large size, 35-5; gimlet-point coach screws, 50; hot pressed nuts, square, $2.50 off per 100 lb.; hexagon, $2.60 off. Structural rivets, ¾ to 1¼ in., 4.40c. to 4.45c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

Store prices are as follows: Structural rivets, 4.75c.; boiler rivets, 4.85c.; machine bolts up to ⅜ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅜ x 6 in., 40-2½; larger sizes, 30-5; hot pressed nuts, square, $3, and hexagon, $3 off per 100 lb.; lag screws, 50.

Wire Products.—Reports recently received from the retail trade handling wire in various forms bear out the more general assertion that stocks in wholesale and retail hands are much below normal. The recent advance in price resulted in the usual anticipatory booking of business. We quote to jobbers as follows, per 100 lb.: Plain wire, Nos. 6 to 9, base, $3.439; wire nails, $3.389; painted barb wire, $3.539; galvanized barb wire, $4.239; polished staples, $3.539; galvanized staples, $4.239, all Chicago.

Cast-Iron Pipe.—The 400 tons of pipe for Chilton, Wis., will go to the United States Cast Iron Pipe & Foundry Company. At Great Falls, Mont., 300 tons is to be bought but the letting at Winnipeg, Ont., has been postponed until next month. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $45.50; 6-in. and larger, $42.50, with $1 extra for class A water pipe and gas pipe.

Old Material.—Sharp advances in the prices of nearly all grades of scrap, particularly heavy melting steel, of which there appears to be a pronounced scarcity, were recorded last week. The leading buyer of steel scrap was in the market, offering, it is stated, $20.50 for shoveling steel and $24.50 for heavy melting, without being able to buy all that it would have been glad to take. Rolling mill grades are likewise higher, No. 1 railroad wrought by as much as $1 per ton. The inquiry for car wheels commented upon last week has developed sales of a considerable quantity with an unusual spread in prices. One transaction of about 2000 tons was at a price approximately $20.25 and it is reported that a like or even greater amount can still be had at $20.50. Yet another sale last week of something over 1500 tons was made on the basis of $21.25, Chicago. Transactions in stove plate last week involving 1200 to 1500 tons were closed at $12, $12.25 and $12.50, indicating that the apparent market level at the beginning of the week was subject to some concessions. While traffic conditions, speaking generally, are regarded as improved, deliveries of old material on contracts are far behind. Scrap offerings from the railroads include 5500 tons, of which 1000 tons is car wheels, by the Chicago, Milwaukee & St. Paul, 1100 tons from the Chicago & Eastern Illinois and small lists from the Chicago & Alton and Chicago Great Western. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton	
Old iron rails	$28.00 to	$29.00
Relaying rails	34.00 to	35.00
Old carwheels	20.25 to	21.25
Old steel rails, rerolling	27.00 to	28.00
Old steel rails, less than 3 ft	26.50 to	27.00
Heavy melting steel scrap	24.00 to	24.50
Frogs, switches and guards, cut apart	24.00 to	24.50
Shoveling steel	20.00 to	20.50
Steel axle turnings	14.50 to	15.00
	Per Net Ton	
Iron angles and splice bars	$27.50 to	$28.00
Iron arch bars and transoms	28.00 to	28.50
Steel angle bars	23.00 to	23.50
Iron car axles	34.00 to	35.00
Steel car axles	34.00 to	35.00
No. 1 railroad wrought	26.00 to	26.50
No. 2 railroad wrought	24.50 to	25.00
Cut forge	24.50 to	25.00
Pipes and flues	14.00 to	14.50
No. 1 busheling	17.00 to	17.50
No. 2 busheling	12.50 to	13.00
Steel knuckles and couplers	22.50 to	23.00
Steel springs	23.50 to	24.00
No. 1 boilers, cut to sheets and rings	14.50 to	15.00
Boiler punchings	19.50 to	20.00
Locomotive tires, smooth	31.00 to	31.50
Machine-shop turnings	9.25 to	9.75
Cast borings	9.25 to	9.75
No. 1 cast scrap	16.50 to	17.00
Stove plate and light cast scrap	12.00 to	12.50
Grate bars	13.00 to	13.50
Brake shoes	13.00 to	13.50
Railroad malleable	18.00 to	18.50
Agricultural malleable	15.50 to	16.00

Philadelphia

PHILADELPHIA, PA., March 13, 1917.

In almost every product, both iron and steel, there are seen the unusually wide range and the irregularity of prices which come with an excess of demand and overburdened capacity for production. Following the announcement by the Steel Corporation of advances on plates, shapes and bars, the quotations of the independent mills have forged ahead, though it must be admitted that the latter would have gone to higher levels had the announcement not come. An interesting feature in the Eastern territory is the activity which has developed in basic pig iron in the past week, the principal consumer taking 40,000 tons, while there are unsatisfied inquiries for thousands of tons. The average price paid for the large purchase was $33.80, delivered, but the producers are now asking $35, furnace. Some of the basic taken came from western Pennsylvania. Makers of Pennsylvania foundry iron have advanced their prices $1 to $3 per ton. Most of the Virginia makers are out of the market, but one offers May and June at $37, furnace. Alabama iron is quoted at $27 to $30, furnace. Plates are still soaring, one large maker now asking 6.159c., Philadelphia, for tank plates. Ship plates are put at 7.659c. by this maker, and it is predicted that ship steel will go to 10c. Domestic consumers are clamoring to enter contracts. Old material is scarce and higher; dealers finding it difficult to buy.

Pig Iron.—Notable activity in basic, which for

months has been dormant and in the matter of price lagging far behind other grades of iron, has occurred in the past few days, and there is still considerable unsatisfied inquiry. The Lukens Steel Company, Coatesville, Pa., has closed for 40,000 tons of basic, placing the business with three or four makers, at an average price of $33.80 delivered. For at least 7500 tons, $35, delivered, was paid. The cheaper part of the purchase consisted of western Pennsylvania basic, of which about 25,000 tons is understood to have been taken. Some producers are now holding for $35, furnace. A local interest is inquiring for 4500 tons of basic for delivery at Cumberland, Md. A large steel company made inquiry for 15,000 tons, and later withdrew it, but there is talk of other inquiries. The market for foundry iron continues to exhibit many irregularities in prices, and changes are being made with even greater rapidity and with little reference to what others are doing. A producer who last week was quoting $35, furnace, now quotes $36, or $37.68, Philadelphia, and the latter price is for this week only. Another maker who quoted and sold at $34.50, furnace, a week ago, has sold at prices which steadily mounted upward, until his quotation of early this week was $37, furnace, the Philadelphia price in this instance being $37.79, for prompt and last-half delivery. This interest has sold some iron for delivery outside of this district for delivery in the first half. Still another seller quotes Pennsylvania iron at $38, furnace, or $39.90, Philadelphia, but has not sold at this figure, at the same time declaring a determination to hold to it. The leading Virginia producer which opened its books for the first half of $31, furnace, or $33.75, Philadelphia, took about 10,000 tons, and then went to $32, furnace, for the same delivery. This maker has favored some of its regular customers by taking some business at $36, furnace, for the third quarter. Still another maker quotes $36, furnace, for the second and third quarters, and one other is out of the market, its last transactions being on the basis of $34, furnace, or $36.75, Philadelphia. For May and June delivery another Virginia furnace asks $37, furnace. Alabama iron appears to range in price from $27 to $30, Birmingham. A Trenton consumer recently paid $27, Birmingham, or $31.50, delivered. A few thousand tons have been taken for export at $27.50, Birmingham. For 2000 tons of Southern No. 3, $26.50, Birmingham, was accepted, but more could not be obtained at that figure. The Southern makers are well sold up, and their representatives confidently expect $30, Birmingham, to rule. The makers of both standard and copper-bearing low-phosphorus iron appear to have settled on $60, delivered, as their quotation, but none has much to sell, and with them the market has been quieter, despite a good export inquiry, mostly from Italy. In general the iron market has been active. While the aggregate of orders booked by some furnaces has not been large, they have turned thousands of tons away. Quotations for standard brands delivered in buyers' yards, prompt shipment, range about as follows:

Eastern Pa. No. 2 X foundry	$36.50 to $37.50
Eastern Pa. No. 2 plain	36.00 to 37.00
Virginia No. 2 X foundry	36.50 to 37.50
Virginia No. 2 plain	36.50 to 37.50
Gray forge	31.50 to 32.00
Basic	33.50 to 35.50
Standard low phosphorus	60.00 to 62.00

Iron Ore.—Arrivals of iron ore at this port in the week ended March 10 consisted of 10,279 tons from Spain and 5400 tons from Cuba. New business in foreign ores is at a standstill, as it has been for months, but business could be done, even at present high prices, were ships available. In this particular, however, the situation is becoming worse because of the commandeering of chartered ships by Great Britain.

Ferroalloys.—More English producers of 80 per cent ferromanganese have withdrawn from the market, and the recent quotation of $185, seaboard, is entirely nominal. Spot domestic is quoted at $290 to $300, delivered, and sales have been made at $290; the third quarter is quoted at $275, and the fourth at $250. The demand is good. Spiegeleisen is active. It is quoted at $75, furnace, and the aggregate of inquiries amounts to about 3000 tons.

Plates.—One of the leading makers has again advanced prices $10 per ton, and now quotes 6.159c., Philadelphia, for tank plates; ship plates at 7.659c., Lloyd's boiler steel at 9.159c., and marine boiler steel at 15.559c. Another important maker quotes tank plates at 5.659c., and ship plates at 7c., mill. A Western mill accepted an order for 2000 tons for fairly prompt delivery at 4.909c., Philadelphia, and 170 tons at 5.159c. The foregoing illustrates the spread of prices for plates. Both export and domestic inquiries are coming in large volume to the makers. A Canadian shipbuilder is seeking 5000 tons of ship steel for shipment within one year. Japan is trying to place further tonnage. Norwegian interests have vainly tried to place ship steel. Meanwhile large domestic users are endeavoring to place contracts, and it is estimated that 100,000 tons of such business was presented in the past week at full prices. Large orders have been placed at 6.159c., Philadelphia, for shipment at the convenience of the mill. It is reported that the ships which the Cunard Line has placed with the Bethlehem Steel Company will require about 65,000 tons of plates and shapes, much of which is being sought. The 2600 small freight cars for which Spain was inquiring are to be built in Spain, although the material is sought here. A Russian inquiry for over 2000 freight cars has been revived.

Structural Material.—In line with the advance of the Steel Corporation to 3.60c., Pittsburgh, the minimum quotation of an eastern Pennsylvania structural mill is now 3.909c., Philadelphia, while it has done business at 4.159c. Another maker quotes 4.659c. for ship shapes. The Strawbridge & Clothier building in this city, which will require several hundred tons of concrete reinforcing material, remains open, likewise the Curtis Publishing Company building for the Philadelphia *Ledger*. Irwin & Leighton have the contract for the Bell Telephone Company building, which will take about 500 tons. Bids are being taken for a municipal library, for which $3,500,000 has been appropriated by the Philadelphia authorities, and which will require 6000 or 7000 tons.

Billets.—The market is nominal because of the existence of what is practically a famine in steel. Were forging billets available it is asserted that they would easily bring $90, mill. Rerolling billets range from $65 to $70, mill. Producers of discard shell bars have done an exceedingly large business in the week, consumers having cheerfully paid $45 for rerolling material and $65 for forging steel.

Bars.—The minimum for steel bars is higher, but somewhat uncertain until some makers have digested the advance of the leading interest to 3.35c., Pittsburgh. Local interests have heretofore been quoting 3.25c., Pittsburgh, as their minimum, but one now quotes 3.909c., Philadelphia. In the past few days an Eastern maker of agricultural implements covered for the last half at 3.25c., Pittsburgh. Bolt and nut makers are covered for the third quarter at 3c., Pittsburgh, and for the last quarter at 3.25c. Iron bars are higher at 3.659c., Philadelphia, carload lots.

Sheets.—Against an active demand sheets are scarce, and there is a pronounced tendency toward higher prices. The minimum for No. 10 blue annealed is 4.909c., Philadelphia, and 5.159c. has been done.

Coke.—Shipments are coming through at a more satisfactory rate, but prices show little tendency to recede. A maker of foundry coke, who booked heavily for last-half delivery at $7.20 per net ton at oven, advanced his price to $8, then withdrew. Other interests ask up to $8.75 for contract, but $8, oven, could still be done yesterday. For spot foundry $13.50 to $14 is quoted. Spot furnace ranges from $10 to $11 per net ton at oven. Contract furnace is nominally $8. Freight rates from the principal producing districts are as follows: Connellsville, $2.05; Latrobe, $1.85 and Mountain, $1.65.

Old Material.—The market is strong and active for both heavy melting steel and wrought-iron scrap. Dealers find it difficult to get material, for the reason that those who hold it are looking for higher prices, and in many cases their trips to usually prolific sources of

supply have been fruitless. The export demand is doing much to strengthen the situation. Quotations for delivery in buyers' yards in this district, covering eastern Pennsylvania and taking freight rates from 35c. to $1.35 per gross ton, are as follows:

No. 1 heavy melting steel	$23.50 to $24.50
Old steel rails, rerolling	31.00 to 33.00
Low phos. heavy melting steel scrap	31.00 to 33.00
Old iron and steel axles (for export)	43.00 to 45.00
Old iron rails	28.00 to 29.00
Old carwheels	21.00 to 22.00
No. 1 railroad wrought	30.00 to 32.00
Wrought-iron pipe	19.50 to 20.50
No. 1 forge fire	16.50 to 17.00
Bundled sheets	16.50 to 17.00
No. 2 busheling	13.00 to 14.00
Machine-shop turnings	14.00 to 14.50
Cast borings	14.50 to 15.00
No. 1 cast	21.00 to 22.00
Grate bars, railroad	16.00 to 16.50
Stove plate	17.00 to 17.50
Railroad malleable	17.50 to 18.00

Buffalo

BUFFALO, N. Y., March 13, 1917.

Pig Iron.—The demand is ahead of the supply, with a developing scarcity of available product and a stiffening of prices all along the line. Many consumers are asking for spot iron to fill in gaps in deliveries from regular sources of supply, and it would appear as though pretty nearly any price producers might choose to ask could be secured were the desired tonnage for prompt delivery obtainable. Some malleable was sold the past week at $38.50, furnace, and the general range of prices for foundry grades, for delivery over the remainder of the year, was $38 to $40, at furnace. Quotations are being asked for deliveries extending into 1918, but furnaces, for the most part, do not feel inclined to name prices beyond 1917, with the uncertainties that are involved in extended forward deliveries. A few, however, are willing under certain circumstances to quote for the extended deliveries asked for. Some furnaces are operating under difficulties, with a very slender margin of raw materials on hand, because of the intermittent way in which shipment of such materials are coming forward to them. Charcoal iron has been sold at $42, f.o.b. Buffalo, for prompt delivery, and this price has now been established as the schedule, with probabilities of a still further advance. In foundry iron, it now looks as though $40 would soon be the minimum for any grade. The Wickwire Steel Company has booked an order for 1000 tons of low-silicon foundry iron for Japan, to go via Seattle, and started shipment. We quote as follows for first-half delivery, f.o.b. furnace, Buffalo:

High-silicon irons	$38.00 to $40.00
No. 1 foundry	38.00 to 40.00
No. 2 X foundry	38.00 to 40.00
No. 2 plain	38.00 to 40.00
No. 3 foundry	38.00 to 40.00
Gray forge	38.00 to 40.00
Malleable	38.00 to 40.00
Basic	38.00 to 40.00
Bessemer	38.00 to 40.00
Charcoal according to brand and analysis	42.00

[NOTE.—Mail service from Buffalo was interrupted last week and our Buffalo report was not received in time for insertion. The quotations on pig iron, which should have been printed as of March 6, were $37 to $40 on each grade of iron except charcoal, on which the prices were $38 to $40.—EDITOR.]

Finished Iron and Steel.—The demand is tremendous for all finished products, and the capacity of mills could be entirely taken up with offerings from users. The feature of the week was the sharp advance announced by the leading interest and by most of the independents of $7 per ton on bars and structural material and $15 per ton on plates, effective March 9. A considerable effort was made by buyers during the week to have mills accept contracts for specification during second and third quarters; and in several instances it is known that customers who had failed to sign proposals that had been submitted prior to the advance were unable to get the mill to accept the tonnage which had previously been offered. Some of the selling agencies seemed more averse to entertaining business at the new prices than they were several weeks ago at the prices then prevailing. Some have not yet begun to take contracts for the second half. Warehouse prices for the district have been advanced to 4.40c. for bars; 4.60c. for structural material; 5.65c. for plates and 5.40c. for hoops.

Old Material.—Market conditions are again strengthening rapidly, with a renewed demand for heavy melting steel, both from local users and from eastern Pennsylvania and Valley points, and the price for this commodity has advanced at least $1.50 per ton. Larger demand is also noted for low-phosphorus scrap, old carwheels and cast scrap; the increased inquiry for cast being attributable largely to the scarcity of prompt pig iron and the stiff prices asked. The aggregate of inquiries received to-day total large tonnages in these commodities. We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$24.00 to $24.50
Low phosphorus	32.00 to 36.00
No. 1 railroad wrought	28.00 to 29.00
No. 1 railroad and machinery cast	22.50 to 23.50
Iron axles	45.00
Steel axles	45.00
Carwheels	23.00 to 23.50
Railroad malleable	22.00 to 23.00
Machine shop turnings	10.50 to 11.00
Heavy axle turnings	16.00 to 16.50
Clean cast borings	11.00 to 11.50
Iron rails	25.00 to 26.00
Locomotive grate bars	15.00 to 15.50
Stove plate	14.00 to 14.50
Wrought pipe	16.00 to 16.50
No. 1 busheling scrap	20.50 to 21.50
No. 2 busheling scrap	13.00 to 13.50
Bundled sheet scrap	14.00 to 14.50

[NOTE.—The missing report of last week would have quoted heavy melting steel scrap at $22.50 to $23.50 but other commodities the same as given in this table.—EDITOR.]

Cleveland

CLEVELAND, OHIO, March 13, 1917.

Iron Ore.—While no recent chartering of vessels for ore is reported, the Lake freight situation is very firm as is indicated by high prices paid this week for charters for coal and grain. Spot tonnage was chartered to load grain in Duluth for Buffalo at 6c. and a block of 100,000 tons of coal was covered at 60c. for delivery to a Lake Michigan port. On March 1 there were 8,440,839 gross tons of ore on Lake Erie docks, or 2,236,100 tons more than on the corresponding date a year ago. The large dock balance was partly due to the unusually cold winter that made the handling of ore difficult and to the car shortage. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, $5.95; Mesaba Bessemer, $5.70; old range non-Bessemer, $5.20; Mesaba non-Bessemer, $5.05.

Pig Iron.—The market is active in all grades and prices continue to advance. Fair inquiry has come out for foundry iron for the first half of next year, but most producers are refusing to quote for delivery beyond the last half of this year. However, one interest has taken a few first half contracts at about $35 for No. 2. The Cleveland price has been advanced to $38 for No. 2 for prompt shipment, at which some business has been taken. Another Ohio furnace has taken on some prompt shipment business at $37. A Cleveland interest has sold considerable foundry iron for the last half for shipment from its Valley furnace at $36, but announces that its price for that delivery will be advanced to $37. One Ohio producer is still taking on some last half tonnage at $35. Several basic sales are reported at $32 and some producers are now asking $35 for that grade. One Cleveland concern has purchased 5000 tons of basic for the last half in order to keep a furnace running on foundry and malleable iron. The price of Southern iron has been advanced to $28, Birmingham, for No. 2, at which price some sales have been made for the last half. Before the advance, several sales were made at $27 and $27.50. For the first half of next year $30 has been quoted on an inquiry for 1500 tons. Virginia iron is being quoted at $32 for No. 2 X for the first half of next year. We quote, delivered Cleveland, as follows:

Bessemer	$36.95 to $37.95
Basic	32.95
Northern No. 2 foundry	36.30 to 38.30
Southern No. 2 foundry	32.00 to 34.00
Gray forge	31.95 to 32.95
Ohio silvery, 8 per cent. silicon	41.62 to 44.62

Coke.—The situation has eased somewhat and prices for prompt shipment are a little lower. Connellsville furnace coke for prompt shipment is quoted down to $10 per net ton and standard foundry coke at $11 to $12. Several inquiries have come out for furnace coke contracts covering furnace requirements of about 5000 tons each per month for the second, third and fourth quarters. Some additional foundry coke contracts for the last half and full year have been made at $7.50 and some producers are asking $8 and higher for contracts.

Finished Iron and Steel.—The market activity has been stimulated by the price advances made last week by the Carnegie Steel Company. A large part of the trade is not yet entirely covered for its full requirements for the last half in steel bars, plates and structural material. While some of the consumers are seeking contracts, the buyers in most cases wish to place definite orders with specifications and to take the steel as soon as the mills are able to make shipments in order to have more assurance that they will have their material when needed. One mill that is in a position to promise shipments in three to four months has advanced its price on steel bars $5 per ton to 3.75c., Pittsburgh. The demand for plates continues heavy and sales in small lots for rather early shipment are being made at 5.25c. to 5.50c., Pittsburgh. An Eastern mill has advanced its price on plates to 6c. Little new structural work requiring round tonnages is coming out and considerable building work in this territory is still being held up because of high prices. Considerable building work in Cleveland is at a standstill because of a strike and lockout and this threatens to extend to nearly all of the building work in the city. Bar iron is firmer as a result of the advance in steel prices and is quoted by Cleveland mills at 3c. to 3.25c. Prices on hard steel bars have also stiffened and these are now quoted at a minimum of 3c., at mill, with some makers asking 3.25c. A leading automobile manufacturer is in the market for a round tonnage of steel for its last half requirements and is understood to have covered for a portion of its requirements. The demand for sheets is very active, particularl for blue annealed. The market is very firm. We quote sheets at 5c. to 5.25c., Ohio mill, for No. 28 black, 4.75c. to 5.25c. for No. 10 blue annealed and 6.75c. to 7.50c. for No. 28 galvanized. Following the advance in mill prices, sharp advances have been made in warehouse prices. New warehouse prices are 4.35c. for steel bars, 5.60c. for plates, 4.60c. for structural material, 5.50c. for hoops and 5.50c. for blue annealed sheets.

Bolts, Nuts and Rivets.—As a result of the advance in the price of steel bars, rivet prices have been advanced $10 a ton and it is very probable that bolt and nut prices will be advanced this week. Active inquiry from railroads and manufacturers for bolt and nut contracts for the last half has developed the past few days, due probably to the advance in steel prices, but manufacturers are refusing to quote for delivery beyond July 1, being unwilling to take on orders for more extended delivery until the price question is disposed of. New prices on rivets are 4.75c., Pittsburgh, for structural and 4.85c. for boiler rivets. Bolt and nut discounts are as follows:

Common carriage bolts, ⅝ x 6 in., smaller or shorter, rolled thread, 40 and 10; cut thread, 40 and 2½; larger or longer, 30 and 5. Machine bolts with h.p. nuts, ⅝ x 4 in., smaller or shorter, rolled thread, 50; cut thread, 40 and 10; larger or longer, 35 and 5. Lag bolts, cone point, 50. Square and hexagon, h.p. nuts, blank, $2.50 off the list; tapped, $2.30 off. C.p.c. and t. hexagon nuts, all sizes, blank, $2.25 off; tapped, $2 off. Cold pressed semi-finished hexagon nuts, 50, 10 and 5 off.

Old Material.—The demand for scrap has improved and the market is firmer. Price advances have been made on several grades. Considerable local inquiry has developed for cast borings for shipment to Eastern consumers, for which $14.25, per gross ton is offered, this amounting to a Cleveland price of $11.08. Heavy melting steel scrap is very firm and not much of this grade is being placed on the market at present. One Ohio mill has an inquiry out for a round tonnage of heavy steel scrap. Another inquiry is for 6000 tons of busheling for export. The demand for cast scrap continues active as a result of the difficulty in getting pig iron and the price of this grade has again been marked up. The Upson Nut Company has shut off on all scrap shipments until March 18. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton

Steel rails	$21.00 to $21.50
Steel rails, rerolling	26.00 to 27.00
Steel rails under 3 ft	26.00 to 26.50
Iron rails	28.00 to 28.50
Steel car axles	47.00 to 48.00
Heavy melting steel	22.50 to 23.00
Carwheels	20.00 to 20.50
Relaying rails, 50 lb. and over	37.00 to 38.00
Agricultural malleable	15.00 to 15.50
Railroad malleable	21.00 to 21.50
Steel axle turnings	16.50 to 17.00
Light bundled sheet scrap	14.50 to 15.00

Per Net Ton

Iron car axles	$44.00 to $45.00
Cast borings	9.25 to 9.50
Iron and steel turnings and drillings	9.25 to 9.50
No. 1 busheling	18.50 to 19.25
No. 1 railroad wrought	25.00 to 26.00
No. 1 cast	18.50 to 19.50
Railroad grate bars	13.25 to 13.50
Stove plate	13.00 to 13.25

Cincinnati

CINCINNATI, OHIO, *March* 14, 1917.—(*By Wire.*)

Pig Iron.—Sales books show a larger total for last week than for any similar period since the first week in February. In central Ohio several lots of 500 tons and over of Southern iron were sold, most of which was for last-half shipment. First-half orders were mainly confined to small lots urgently needed. The minimum price of $27, Birmingham, has been withdrawn, and from $29 to $30 at furnace represents today's quotations for any shipment this year. Quite a large tonnage of Southern iron was taken for last-half shipment at $30, Birmingham. Sales in Indiana and southern Illinois were also made at the same figure, the largest reported being for 1000 tons. Conservative estimates of stocks from different sources in the South, including all grades of iron, average about 250,000 tons. Inquiries for the first half of next year are numerous but consumers are slow in placing contracts. There is a surprisingly large call for foundry iron for shipment the last half of this year, indicating that many melters are not yet covered for their entire requirements this year. The Northern foundry quotation is only nominal at $35, Ironton, as there is very little iron in that district to be sold for shipment before July 1 and only a limited tonnage that can be booked for the last half. A Michigan manufacturer bought a round tonnage of coke and charcoal malleable for the last half, the order being divided between different furnaces. Lake Superior charcoal has been advanced from $2 to $3 per ton, and Ohio silvery irons have also been marked up. Virginia producers are now asking $32 at furnace for No. 2X as against $31 made last week for first-half shipment in 1918. Based on freight rates of $2.90 from Birmingham, and $1.26 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft	$32.40 to $32.90
Southern coke, No. 2 f'dry and 2 soft	31.90 to 32.40
Southern coke, No. 3 foundry	31.40 to 31.90
Southern coke, No. 4 foundry	30.90 to 31.40
Southern gray forge	27.90 to 28.40
Ohio silvery, 8 per cent silicon	43.26 to 44.26
Southern Ohio coke, No. 1	36.76
Southern Ohio coke, No. 2	36.26
Southern Ohio coke, No. 3	35.76
Southern Ohio malleable Bessemer	36.26
Basic, Northern	36.26
Lake Superior charcoal	37.20
Standard Southern carwheel	32.90

(*By Mail*)

Finished Material.—Local jobbers have marked up quotations on practically everything handled. We quote store prices as follows: Wire nails, $3.60, base; barb wire, $4.45 per 100 lb.; steel bars, 4.15c., base; rounds and squares, 2-in. and over, 4.45c.; structural shapes, 4.40c.; plates, ¼-in. and heavier, 5.50c.; 3/16-in., 5.60c.; No. 8 gage, 5.65c.; twisted steel bars, 4.30c.; No. 10 blue annealed sheets, 5.50c.; machine bolts, ⅝ x 4-in. and smaller, 50 per cent discount; larger and longer, 30 and 10 per cent discount; hack saws, 10 per cent discount; set screws, 45 per cent discount, and files, 50

and 10 per cent discount. The mill quotation on No. 28 galvanized sheets is 7.40c., Cincinnati or Newport, Ky.; No. 28 black, 5.40c., and No. 10 blue annealed 5.15c.

Coke.—Foundry coke prices continue to advance and contract figures in all three fields now range from $8 to $8.50 per net ton at oven. There has been some business booked at the last named figure for July-December shipment. However, within the last two weeks quite a number of yearly contracts were made at prices ranging from $6 to $7.50. Prompt shipment prices are unsettled and where coke can be delivered promptly $14.50 has been obtained. Coke for nearby shipment is now moving more freely and a few carload lots have been disposed of at $10. Furnace coke is stronger, but no new contracts have been made in this vicinity, although some coke has been taken for emergency uses at $1 to $2 above the regular contract figures, which are from $6 to $7.50 per net ton at oven.

Old Material.—The market is more active. The foundries are substituting scrap wherever possible, due to the rapidly advancing cost of pig iron. While scrap prices have not been marked up in the past few days they are very firm at the quotations given. The following are dealers' prices, f.o.b. at yards, southern Ohio and Cincinnati:

Per Gross Ton

Bundled sheet scrap	$15.00 to $15.50
Old iron rails	24.75 to 25.25
Relaying rails, 50 lb. and up	28.25 to 28.75
Rerolling steel rails	24.75 to 25.25
Heavy melting steel scrap	21.25 to 21.75
Steel rails for melting	21.25 to 21.75

Per Net Ton

No. 1 railroad wrought	$22.00 to $22.50
Cast borings	6.50 to 7.00
Steel turnings	6.50 to 7.00
Railroad cast	16.25 to 17.25
No. 1 machinery cast	18.00 to 18.50
Burnt scrap	10.25 to 10.75
Iron axles	33.50 to 34.00
Locomotive tires (smooth inside)	28.00 to 28.50
Pipes and flues	13.75 to 14.25
Malleable cast	15.25 to 15.75
Railroad tank and sheet	12.25 to 12.75

Birmingham

BIRMINGHAM, ALA., March 12, 1917.

Pig Iron.—What pig iron will sell at from day to day no one is predicting. The demand is stronger than it has yet been and melters are more anxious for the actual iron than ever before. Early last week sales were made of regular No. 2 foundry at $27.50. One small producer quoted that price as a "feeler" and immediately did all the business desired, something like 4000 tons, and withdrew. The Alabama Company sold some high manganese iron at $30.50. The leading interest was among those participating in the $27.50 business, and on Saturday was on a $28 basis with very little to be offered. It may be said that the week ended with iron at a minimum of $27.50 under the most favorable circumstances, and that the majority of makers were on a basis of $28 and apt to go still higher on slight provocation. Even at these prices Southern iron is still a trifle behind the procession. It is, therefore, evident that $30 iron is so likely as to seem imminent. All furnacemen are well sold up for the remainder of the year and pressure of some consumers to enter into contracts for 1918 may eventuate. Some slight business for that delivery is unofficially reported. It was learned with some surprise that stocks on Alabama yards went down another 10,000 tons in February in spite of the car shortage and the heavy make. Free foundry and warrant irons both show shrinkage, while the accumulations of basic slightly increased. The car shortage has here and there caused short stoppages of foundries, but as a rule they keep going in a hand-to-mouth order. Consumers everywhere seem to have underestimated their requirements. We quote, per gross ton, f. o. b. Birmingham district furnaces, as follows:

No. 1 foundry and soft	$28.00 to $28.50
No. 2 foundry and soft	27.50 to 28.00
No. 3 foundry	27.00 to 27.50
No. 4 foundry	26.75 to 27.25
Gray forge	26.50 to 27.00
Basic	27.50 to 28.00
Charcoal	28.00 to 29.00

Steel Bars.—Quotations are 3.30c. to 3.50c., Birmingham, in carload lots.

Cast-Iron Pipe.—A few scattering orders have been received since the advance in prices, and plant operation will be maintained. Oil fields in the Southwest are ordering much flanged pipe. We quote, per net ton, f.o.b. pipe shop yards, as follows: 4-in., $40; 6-in. and upward, $37, with $1 added for gas pipe and special lengths. The option obtained by the Wood interests of Philadelphia on the National Cast Iron Pipe Company's plant in Birmingham has not been exercised.

Coal and Coke.—Several steam coal contracts, which went last year at $1.05 to $1.20, have been renewed for another year at $2.50. This represents the average. Spot steam coal brings as high as $3.50 per net ton at mine. The minimum for standard beehive foundry coke is $12 to $12.50 per net ton at oven for spot and $9 for forward delivery to regular customers. In some instances forward contracts have been made at $9.50 and $10. Furnace coke ranges from $4.50 to $6.

Old Material.—The scrap market has taken on much new life. Both wrought and steel have advanced in price and all lines are stronger under an easing up of some of the embargoes and a generally brighter trade atmosphere. We quote, per gross ton, f. o. b. Birmingham district yards, to consumers, as follows:

Old steel axles	$35.00 to $36.00
Old steel rails	19.00 to 19.50
No. 1 wrought	18.50 to 19.50
No. 1 melting steel	16.00 to 16.50
No. 1 machinery	16.50 to 17.00
Carwheels	17.00 to 18.00
Tram carwheels	12.00 to 12.50
Stove plate and light	11.00 to 11.50
Machine-shop turnings and borings	8.00 to 8.50

San Francisco

SAN FRANCISCO, CAL., March 6, 1917.

The situation as regards steel products is more uncertain on the Pacific coast this week than it has been in years. Not only are the recent price advances upsetting many plans, but the shipping conditions are not improving, especially transcontinental railroad shipments. Local people are beginning to feel the pinch seriously on certain commodities, and unless a speedy improvement is manifest there will be serious handicaps at the beginning of the spring building season. San Francisco jobbers state that coastwise shipping conditions are not very good, but they are much better than the transcontinental. The jobbers are busy revising their price-lists in sympathy with the new mill schedules on wrought pipe, wire products and other lines.

Bars.—No advance is reported but one is expected any moment on account of the soaring price of raw materials. Coast production is sufficient to supply current demands to a large extent, but considerable quantities of reinforcing bars and other bars are coming from the East. Reinforcing bars from coast manufacturers remain for the time being on a 3.75c. base. Jobbers' prices are 4.35c. for sizes under 3-in., and 4.85c. for sizes larger than 3-in., made in the East. There is a limited demand for iron bars, the price being 4.25c.

Structural Material.—Difficulty in getting structural shapes continues. Local fabricators complain of the delay of materials on the road and difficulty in getting sufficient supplies. With material selling for delivery in the first half of 1918, the outlook is none too promising. The lighter shapes handled by coast jobbers are more readily available and stocks are still holding out fairly well. Angles, channels and tees under 3-in. are quoted at 4.65c.; over 3-in., at 4.75c. flat; I-beams, 4 to 15 in., and 50 to 60 ft. long, also 4.75c. flat. The Pacific Rolling Mills, San Francisco, did the fabricating for the new Petaluma Creek bridge, one of the bridges of the extended State highway. The bridge is a bascule span. The same company is making the structural steel for a three-story and basement office building for the Union Iron Works, San Francisco, to cost $48,012. The estimated cost of the new Princeton bridge to be built by Glen and Colusa counties has now risen to $240,000. If present plans are adopted the structure will be of the lift type.

Plates.—It is becoming more and more difficult to get tank plates, the demand far exceeding the ability of manufacturers to supply. Yet the coast demand for

riveted tanks and pipes is not much more than normal. The railroad congestion is blamed for much of the plate shortage, as well as the stimulated shipbuilding. Prices quoted this week show as yet no advance, the quotation being 6c. on tank plates. Jobbers are getting very low on short and extra wide plates. John F. Craig, Long Beach, Cal., has the contract to build a steel ship, a duplicate of the Alvarado which Craig built at a cost of $225,000. Contracts for materials to be used in the construction of the hulls of two destroyers to be built at Vallejo, Cal., have been awarded to the Carnegie Steel Company and the American Sheet & Tin Plate Company. The Hanlon shipyard in East Oakland has accepted the contract to build two 5000-ton steel freighters for a New York firm. These will be the first steel vessels to be constructed by Hanlon.

Sheets.—The market is strong on blue annealed and there is a fair demand for black. Jobbers are weak on galvanized, including corrugated. Stock is scarce by reason of delayed shipments from the mills. Flat galvanized has advanced to 7.99c. on Nos. 12 and 14. No. 28 is quoted at 8.87c. The quotation on Nos. 10, 12, 14 and 16 blue annealed remains at 6.25c.

Wrought Pipe.—In proportion to the advance at the mills, the present quotations on the coast have been advanced $4 and $6 per ton on all welded and seamless goods. The latter rise applies to standard pipe and oil-country tubing as well as seamless. Jobbers will advance their prices on all tubing affected by the mill prices this week. The advances will probably be from 4 to 5 per cent. The jobbers are not especially crowding the mills for shipments on tubing, which would indicate that local stocks are still fair. Export business is increasing notwithstanding high ocean freight tariffs. Boiler tubes are scarce.

Cast-Iron Pipe.—The market is a little stronger, but not a great deal of tonnage is offering. Since the advance of $1 per ton on Feb. 26, 6-in. and larger, class B and heavier, are quoted at $50, and 4-in., class B and heavier, at $53. Gas pipe is $1 extra. The Board of Works, San Francisco, has decided to sell surplus high-pressure water pipe in order to provide funds for extending the system in the Richmond district. At present prices $30,000 is expected to be realized.

Pig Iron.—Prices are uncertain owing to rising tendencies of furnace quotations. The No. 1 foundry is priced at $41.50, but higher is paid on small quantities. Local supplies are now pretty low.

Coke.—In lots of 500 to 1000 tons the quotation is $23.75. Lesser lots sell at about $25. Coke is expected to go higher unless the car situation improves immediately.

Ferroalloys.—Ferrosilicon is rapidly advancing, the second-quarter prices being anywhere around $300, with prospects of a further advance. Ferromanganese, second quarter, is quoted around $325.

Wire Products.—This week prices jumped 20c. per 100 lb., making, with the 10c. advance the first of the year, 30c. increase in the coast cost of nails and other wire products. Jobbing stocks are said to be in pretty fair shape. Nails are priced by manufacturers at 3.95c., base, with jobbers' prices to see a proportionate advance probably this week.

Old Materials.—The scrap market is active and strong. Steel scrap brings as high at $20, with sales at somewhat lower figures, according to the lots taken and other peculiar conditions. The best cast-iron scrap easily fetches over $20.

The United States District Court at Newark, N. J., has ordered the public sale after April 29 of the plant of the Camden Iron Works, Camden, N. J., manufacturer of cast-iron pipe, hydraulic tools, etc., which has for some time been operated by Huelings Lippincott, receiver. The sale will be made with the condition that the purchaser will assume orders to the total of about $1,500,000, contracted for by the receiver. The funds now held by him indicate the payment of a 50 per cent dividend on the total of $1,000,000 liabilities, while the plant is said to be averaging an income of about $1,000 a day.

New York

NEW YORK, March 14, 1917.

Pig Iron.—The difficulty of securing iron from the South on contracts necessitated further purchases of spot iron from Northern furnaces early last week, but to-day more conservatism is being exercised by consumers whose attention is being centered more upon covering requirements for the last half of this year. Prices for this delivery have advanced again from $2 to $3 per ton. Several large contracts for basic and foundry grades have been closed, supplemented by a number of small sales running from 500 to 1000 tons each, also for delivery over the second half of the year. The surprising feature, however, is further buying of Virginia iron for shipment over the first half of 1918 at an advance of $1 per ton. Consumers of steel-making iron are much interested in the purchase of 37,500 tons of basic metal by an eastern Pennsylvania plate maker, including 20,000 to 25,000 tons purchased in the Pittsburgh district at $33.25 delivered; the balance of the tonnage was secured from several eastern Pennsylvania furnaces at $35 delivered, shipments to be made over the second half of 1917. To-day some of the eastern Pennsylvania furnaces that sold a few days ago at $34, furnace, are asking $36 and even $37 per ton for this year's shipment. One consumer at Bridgeport, Conn., is understood to have secured 6000 tons of basic in two lots from eastern Pennsylvania furnaces at $34 per ton at furnace. Alabama furnaces have little or no basic to sell, but the last transaction was made close to $25 per ton, Birmingham. The Virginia Iron, Coal & Coke Company, after securing orders for about 10,000 tons of foundry grades on the basis of $31 for No. 2 at the furnace for shipment over the first half of 1918, advanced its asking price to $32 and has taken contracts for 3000 to 4000 tons on this basis. For this year's delivery some sales of Virginia iron have been made within the last few days at $36, furnace. Eastern and central Pennsylvania furnaces have taken contracts for foundry grades aggregating about 6000 tons for shipment into New Jersey, Connecticut and New York State, at prices ranging from $34 to $36 at the furnace. Furnaces in the Lehigh Valley are now asking $36 to $37 at the furnace for No. 2 foundry, while one central Pennsylvania furnace has made sales as high as $38 at the furnace for this year's shipment. Inquiries are now in the market for about 20,000 tons of foundry grades, including one lot of 3300 tons for an electrical equipment manufacturer. A few sales of Alabama iron into the Hudson Valley and into New England have been made mostly at basis of $26 for No. 2, Birmingham; there is a range of $4 per ton on quotations, with $30 more generally asked to-day. The greater strength of the Southern market is attributed to the recent purchase of 25,000 tons in the Birmingham district by the largest cast-iron pipe interest. Few export sales are being made. The numerous inquiries include a round tonnage for the Argentine Republic. One lot of 10,000 tons of standard Bessemer is offered for resale, tidewater, New York, at $37 per ton. We quote at tidewater for early delivery: No. 1 foundry, $36 to $37; No. 2 X, $35.50 to $36.50; No. 2 plain, $35 to $36; Southern iron at tidewater, $31.25 to $33.25 for No. 1 and $30.25 to $32.25 for No. 2 foundry and No. 2 soft.

Ferroalloys.—Most of the British makers of ferromanganese are out of the market for the present, having had definite orders to make no more sales. It is understood that none can now be sold until permission is obtained from the British Government. This attitude only intensifies the restrictions hitherto existing because dealers on this side were previously permitted to sell the alloy subject to license from that government. One New York representative of a British producer has a small amount available for delivery in the last half at $200, the quotation until recently having been $185, seaboard. A few carloads of domestic alloy have been sold in the last week at $300, delivered, but the market is generally quiet with very few inquiries reported. At the most they do not total over 3000 tons. Arrivals of British alloy in February will amount to nearly 6000 tons, 5076 tons having already been reported to

THE IRON AGE from two ports. One British maker is now shipping after having sold none to the United States for over a year and a half. The domestic production of 80 per cent ferromanganese was very close to 20,000 gross tons last month, making the fifth consecutive month that the output has averaged as much as this. Spiegeleisen, 20 per cent, is strong and active at $75, furnace, while for last-half delivery the quotation is $60 to $65, furnace. Ferrosilicon, 50 per cent, continues in strong demand, and is as scarce as ever.

Structural Material.—Business is surprisingly active, the recent extraordinary advance in prices stimulating contractors to place orders for which they had virtual options at previous prices. The largest contracts are for manufacturing plant extensions, but the railroads are displaying increased interest. The Pennsylvania Railroad is now in the market for 12 small bridges calling for 900 tons of shapes. The Delaware, Lackawanna & Western asks for bids on 1100 tons of bridge work. The Baltimore & Ohio has given an order for 700 tons to the Fort Pitt Bridge Works. The Minneapolis, St. Paul & Sault Ste. Marie has placed 510 tons. The New Haven is asking for prices on 300 tons and the Chesapeake & Ohio for 300 tons. The Norfolk & Western has given an order for 400 tons to the Virginia Bridge & Iron Works, it is understood. Among contracts closed are 250 tons at Plainfield, N. J., for the Niles-Bement-Pond Company, placed with Lewis F. Shoemaker & Co.; 700 tons for an office building on William Street, New York City, with the Eastern Steel Company; 700 tons for a hotel on West Twenty-eighth Street with the Hinkle Iron Works; 1500 tons for the Erie Forge Company with the Lackawanna Bridge Company; 350 tons for a power house at McAfee, N. J., for the Bethlehem Steel Company, awarded to the Guerber Engineering Company; 295 tons for the Champion Tool Works, Cincinnati; 1600 tons for a hotel at Cleveland for the Terminal Properties Company, placed with the American Bridge Company; 1225 tons for an extension to a smelter at Garfield, Utah, placed with the Kansas City Structural Steel Company; 1146 tons for transmission towers at Poughkeepsie, placed by the J. G. White Company with Riter-Conley Company; 700 tons for buildings on Randall's Island, placed with the Harris, Silvers, Baker Company and 800 tons for the Brown Thompson department store at Hartford, Conn., placed with the Berlin Construction Company. The United States Government has awarded 274 tons for dam No. 43 on the Ohio River with the American Bridge Company. Included in the inquiries still on the market are 3300 tons for an electric shop for the Philadelphia Navy Yard, 2000 tons for the Free Library, Philadelphia, 800 tons for the Alan Wood Steel Company and 700 tons for the Belmont residence at Sands Point, L. I. Bids will be taken April 3 on subway construction in Philadelphia calling for 10,000 tons of structural steel. The Kansas City Consolidated Refining & Smelting Company has placed a contract for 900 tons for a smelter at El Paso, Texas, with the El Paso Bridge & Iron Company. Structural shapes have been advanced $7 per ton by the Carnegie Steel Company to 3.60c., f.o.b. mill Pittsburgh, for shipment at the convenience of the mill. The general market, however, ranges from 3.40c. to 4c. per lb. at the mill, while marine shapes are difficult to purchase under 4c. to 4.50c. per lb. We quote mill shipments of shapes in two to five months at 3.569c. to 4.169c., New York. Warehouse shipments are $8 per ton higher and are now at 4.50c., New York.

Billets and Bars.—Export agents at New York have secured several lots of billets from Pittsburgh mills at prices considerably under open quotations. Most of this steel will be shipped to the Mediterranean; in fact, some shipments have been made recently to Genoa, but as a rule exports are sharply curtailed because of the dangers to ocean traffic. One lot of 20,000 tons of high-carbon steel bars has been sold for export to France over the last six or seven months of this year; the price is understood to be 4.50c. per lb. The Carnegie Steel Company has advanced the price of bars $7 per ton to 3.35c., Pittsburgh. Independent mills in the East are asking 3.50c. to 4c. per lb., Pittsburgh base, and have taken business at these prices for shipment during the latter part of this year and the first half of 1918. We quote mill shipments of steel bars at 3.519c. to 3.919c., New York, the lower price for indefinite delivery and the higher for small quantities in, say, three months. We quote mill shipments of bar iron at $5 per ton above last week, or 3.669c., New York. Out of warehouse iron bars are now 4c., and steel bars 4.35c., New York.

Steel Plates.—Carbuilders and shipyards have placed several substantial contracts with eastern and western Pennsylvania mills for shipment over the first and second half of 1918. The Union Tank Line has placed an order for 1250 tank cars with the American Car & Foundry Company and the 15,000 tons of plates and shapes required are understood to have been placed with a Pittsburgh mill. Another inquiry for 20,000 tons of plates and shapes for 2000 cars is going begging. An Eastern shipyard has placed a contract for 5000 tons of steel plates with the largest interests for shipment over the last half of 1918. Another Atlantic coast yard has bought 2500 tons from an eastern Pennsylvania mill, while another mill in the same locality has taken a number of small orders aggregating 2500 tons for the same shipment. The latter contracts, it is stated, have been taken at 7c. per lb. The Texas Company has taken a contract for three additional ships to be built at Bath, Me. An Atlantic coast yard is endeavoring to buy 20,000 tons of plates and shapes for shipment over the last half of 1918 and first quarter of 1919. The Navy Department is scheduled to take bids March 14 on five scout cruisers, calling for about 15,000 tons of plates, and on April 4 on 15 torpedo boats calling for about 7500 tons of steel. The Allies are inquiring for 6000 tons of ship plates for Great Britain. Most of the foreign inquiries for ship plates are for the Orient. Eastern Pennsylvania mills have again advanced prices $10 per ton, asking as high as 6c. per lb. for structural plates and 7½c. per lb. for ship plates. Marine shapes sell at 4c. to 4.50c. per lb. The Carnegie Steel Company has advanced prices of tank plates $15 per ton, to 4.50c. per lb., f.o.b Pittsburgh, for shipment at the convenience of the mill. We quote best deliveries on universal plates at 5.159c. to 5.669c., New York; ordinary tank plates at 5.419c. to 6.169c., and ship plates at 7.169c. to 7.669c., but indefinite delivery plates at 4.669c., New York. Out of store we quote 5½c., representing an advance of $10 per ton from lowest recent quotations.

Railroad Equipment.—The Michigan Central Railroad has specified on 7000 tons of standard section rails for shipment during the summer of 1918, the rails to be rolled at Pittsburgh. The Pere Marquette has ordered 10,000 tons of standard section, for 1918 shipment from Chicago mills. The Union Tank Line has placed an order for 1250 tank cars with the American Car & Foundry Company. The Seaboard Air Line is in the market for 2000 cars and the Philadelphia & Reading for 2000 additional cars. The Canadian Car & Foundry Company is understood to have taken an order for 2000 cars for the Russian Government.

Cast-Iron Pipe.—Interest centers on the large letting at Rochester, N. Y., on which bids will be opened to-day or to-morrow calling for 10,750 tons of 37-in. pipe, on which bids are being taken on both cast-iron and lock-bar steel. It is believed in the trade that steel pipe will not prove to be a formidable competitor because of the extremely high cost of the plates required and the uncertainty of their delivery. Cambridge, Mass., opens bids on 150 tons on Thursday of this week. Hartford, Conn., is coming in the market for a large quantity of pipe, having asked for bids on 7000 tons, to be opened March 20, of 6 to 42 in., but principally 42. The letting of 5000 tons at Winnipeg, Canada, has been postponed to April 16. Numerous buyers of pipe are now becoming convinced that prices are not likely to be lower in the near future, and buying is therefore more active. Private inquiries are considerably greater than they have been for some time. The advancing cost of pig iron has compelled Northern pipe manufacturers to follow the example of their Southern colleagues and the price of pipe has been advanced $1 per ton. Carload lots of 6-in., class B and heavier, are now quoted

at $42.50 per net ton, tidewater, with class A and gas pipe taking the usual extra of $1 per ton.

Old Material.—The market is active and most prices are higher. The demand is especially good for wrought scrap, cast borings and relaying rails. Considerably more business could be done in steel scrap if holders were willing to sell at current prices, but they have become convinced that the market will reach a much higher level and consequently this is making the available supply appear scarce. Brokers quote buying prices as follows to local dealers and producers, per gross ton, New York:

Heavy melting steel scrap	$22.00 to $22.50
Relaying rails	40.00 to 41.00
Rerolling rails	30.00 to 31.00
Iron and steel car axles	42.00 to 43.00
No. 1 railroad wrought	30.00 to 31.00
Wrought-iron track scrap	26.00 to 27.00
No. 1 yard wrought, long	25.00 to 26.00
Light iron	7.00 to 8.00
Cast borings (clean)	13.50 to 14.00
Machine shop turnings	12.50 to 13.00
Mixed borings and turnings	11.50 to 12.00
Wrought-iron pipe (not galvanized or enameled)	19.00 to 19.50

Foundries are good buyers of all kinds of cast scrap, including carwheels and malleable cast. Prices are higher. The quotations given below are those paid by consumers purchasing in good quantities, but foundries in New York City and Brooklyn continue to secure small lots of Nos. 1 and 2 cast from nearby dealers at $1.50 to $2 less per gross ton:

No. 1 cast	$22.50 to $23.00
No. 2 cast	20.00 to 21.00
Stove plate	15.50 to 16.00
Locomotive grate bars	15.50 to 16.00
Old carwheels	22.00 to 23.00
Malleable cast (railroad)	22.50 to 23.00

British Steel Market

Pig-Iron Output Increasing—Tin Plates Irregular and Ferromanganese Firm

(By Cable)

LONDON, ENGLAND, March 14, 1917.

The pig-iron market is firm, with the output of basic and hematite iron increasing. Tin plates are irregular at 26s. 6d. base. Ferromanganese is firm. Billets are nominal, with $68 asked for 4-in. billets at American mills for July-August delivery. Wire rods are about £29 c.i.f. April shipment. We quote as follows:

Tin plates coke 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 26s. 6d. against 27s. last week.

Steel black sheets, No. 28, export, f.o.b. Liverpool, £19 5s.

Hematite pig iron, f.o.b. Tees, 142s. 6d.

Sheet bars (Welsh) delivered at works in Swansea Valley, £15 5s. nominal.

Ferromanganese, £37 nominal.

Ferrosilicon, 50 per cent. c.i.f., £35 upward.

Tin-Plate Situation Worse—American Steel Scarce—Australia Offers Help

(By Mail)

LONDON, ENGLAND, Feb. 13, 1917.—The supply of raw materials is well sustained, but the pressure of activity becomes more intense and expiring contracts are being constantly renewed. Much inconvenience has been caused by the irregularity in deliveries of fuel due to the unusually severe weather.

As to the position of pig iron, the current output of foundry grades on the East Coast is being steadily absorbed, but there is no lack of iron to meet essential needs, while the allocation of deliveries under official control is proceeding freely. Licenses for export have been issued more freely, and there has been an improvement in shipments. The forward demand is as active as ever and new bookings are being made on a fair scale, though ironmasters are not eager sellers. Consumers of hematite seem quite satisfied with current deliveries.

The clearances from the Tees in January were 35,629 gross tons, nearly the whole of which went abroad, chiefly to France. The total exports from United Kingdom ports were 61,201 tons, or fully 17,000 tons less than in 1916. The Middlesbrough furnace output in 1916 was returned as 2,307,000 tons, made up of 976,000 tons of Cleveland and 1,331,000 tons of hematite against 2,154,000 tons, 1,095,000 tons and 1,059,000 tons respectively in 1915.

The outlook in semi-finished steel is tight, the home output being absorbed by national requirements. American material is extremely scarce, c.i.f. offers having practically disappeared. The position of shipping, of course, tends to render the possibility of relief remote. The current quotation of about $95, c.i.f. Liverpool for forward shipment is nominal. There is an incessant demand for wire rods for which upward of £28 10s., c.i.f. United Kingdom ports, is obtainable.

In finished iron and steel government requirements absorb practically the full capacity, though an additional tonnage has had to be provided lately by makers of shipbuilding material to speed up the construction of new cargo steamers. Scotch steel plants have an enormous amount of special work to grapple with. The demand for all classes of finished material continues to outstrip the supply, and the tendency of prices is to harden, although government regulations act as a check.

The unabated difficulty experienced by the tin-plate and galvanized sheet mills in getting hold of steel restrains operations, exports being kept down to a minimum. The position of the Welsh tin-plate mills is becoming worse, the working off of old export orders being more handicapped than ever by the comparatively few licenses obtainable. The granting of government certificates for home trading, moverover, has been a matter of so much discrimination that business has been brought almost to a standstill, which can only be remedied by applications for certificates being dealt with more regularly and with less delay. Between this serious drawback and the works running short of specifications, makers have made resales at cut prices and the market is depressed in spite of the small output. Exports are poor and the Swansea stocks are increasing.

According to mail advices, the Australian Government has intimated its readiness to reserve a half of the local output of iron and steel for the mother country for war purposes, while the proposed exports, it is stated, would not interfere with the work of Australian engineering shops to any great extent.

St. Louis

ST. LOUIS, MO., March 12, 1917.

Pig Iron.—Increasing pressure for pig iron has developed. While a considerable number of sales have been made, far more than the amount sold could not be placed with the furnaces through the makers' unwillingness to contract at the prices purchasers were willing to pay. The sales were quite heavy, including about 15,000 tons of basic and probably a total of 7500 tons of foundry iron. The calls for pig iron which remained unfilled are estimated at about 10,000 tons. The basic sale reported was between $34 and $35 per ton, the price being withheld. The contract was placed with Northern furnaces, and the delivery is set for last half. Any number of purchasers would be willing to place orders for 1918 delivery, but no furnaces are willing to take such business. Lake Superior charcoal iron was sold in one or two small lots at $40, Detroit.

Coke.—Sales made were at $12, $13 and even $14, Connellsville, for prompt delivery best selected 72-hr.

Finished Iron and Steel.—The finished products market accepted advances during the week in a calm state of mind, largely because the consumers were aware that even at the prices made there was little prospect of getting any material. Specifications continue heavy and all material available is being taken freely without question as to the price. It is simply a question of getting it. In standard section steel rails an inquiry for 1700 tons for a Southwestern road made its appearance. Light rails are being taken as freely as mills will permit. Track fastenings are in active request. Sharp advances were made on material in warehouse, on which we quote as follows: Soft steel bars, 4.05c.; iron bars, 4c.; structural material, 4.30c.; tank plates, 5.55c.; No. 10 blue annealed sheets, 5.55c.; No. 28 black sheets, cold rolled, one pass, 5.75c.; No. 28 galvanized sheets,

8c. The advance has had no apparent effect on the demand.

Old Material.—Prices have taken a step upward, with the dealers expecting still further increases as soon as it becomes possible to move material. Offerings from the railroads continue light. The firmest features of the list are heavy melting steel and wrought scrap. Carwheels are well held, but not materially higher, largely because of the recognized inability of dealers to deliver. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

	Per Gross Ton	
Old iron rails	$27.50 to	$28.00
Old steel rails, rerolling	28.00 to	28.50
Old steel rails, less than 3 ft	26.50 to	27.00
Relaying rails, standard section, subject to inspection	34.00 to	35.00
Old carwheels	21.00 to	21.50
No. 1 railroad heavy melting steel scrap	24.00 to	24.50
Heavy shoveling steel	21.50 to	22.00
Ordinary shoveling steel	19.00 to	19.50
Frogs, switches and guards cut apart	24.50 to	25.00
Ordinary bundled sheet scrap	15.00 to	15.50
	Per Net Ton	
Iron angle bars	$26.50 to	$27.00
Steel angle bars	22.50 to	23.00
Iron car axles	35.00 to	35.50
Steel car axles	34.50 to	35.00
Wrought arch bars and transoms	28.00 to	28.50
No. 1 railroad wrought	25.00 to	25.50
No. 2 railroad wrought	24.50 to	25.00
Railroad springs	24.00 to	24.50
Steel couplers and knuckles	25.50 to	26.00
Locomotive tires, 42 in. and over, smooth inside	33.50 to	34.00
No. 1 dealers' forge	18.50 to	19.00
Cast iron borings	10.00 to	10.50
No. 1 busheling	18.00 to	18.50
No. 1 boilers, cut to sheets and rings	14.50 to	15.00
No. 1 railroad cast scrap	16.00 to	16.50
Stove plate and light cast scrap	11.50 to	12.00
Railroad malleable	17.50 to	18.00
Agricultural malleable	16.50 to	17.00
Pipes and flues	15.50 to	16.00
Heavy railroad sheet and tank scrap	14.50 to	15.00
Railroad grate bars	13.00 to	13.50
Machine-shop turnings	10.50 to	11.00
Heavy axle and tire turnings	13.00 to	13.50

Will Soon Be Taken Over

Negotiations for the acquisition of the J. Wood & Brothers Company, Conshohocken, Pa., by the Alan Wood Iron & Steel Company, Philadelphia and Conshohocken, are practically completed. Actual transfer of the property has been awaiting the settlement of many little problems which arose from the fact that the J. Wood & Brothers Company was organized 85 years ago. These problems were minor, but necessarily had to be smoothed out to insure a clear title. Through the purchase of the company, the Alan Wood Iron & Steel Company adds 20,000 tons per annum to its capacity for the production of sheets and light plates.

New Coke-Oven Plant for Ironton District

The Ironton Solvay Coke Company has been organized by the Semet-Solvay Company, Syracuse, N. Y., to construct and operate a plant of 60 by-product coke ovens to supply blast-furnace and foundry coke in the Ironton district. The plant will have a capacity for coking about 1200 tons of coal per day, and provisions will be made for doubling it later on. A site of about 70 acres on the eastern limits of the city of Ironton, Ohio, has been acquired. The following officers have been elected: J. G. Hazard, president; E. C. Witherby, vice-president; M. D. Whitford, treasurer, and R. B. Parker, secretary and general manager. W. H. Blauvelt is consulting engineer.

Another Rennerfelt Furnace Sold

Hamilton & Hansell, 17 Battery Place, New York City, have sold a 1-ton Rennerfelt electric furnace to the Oklahoma Iron Works, Tulsa, Okla., for installation in its new steel foundry.

The new 1½-ton Rennerfelt furnace, recently installed at the plant of the Parsons Company, Newton, Iowa, is now in operation.

The Canadian Government has awarded contracts to the Wallace Shipbuilding Company, Vancouver, B. C., and Cameron-Genoa Company, Victoria, B. C., for two auxiliary schooners, costing $250,000 each.

Iron and Industrial Stocks

NEW YORK, March 14, 1917.

The industrial stocks have been the particularly prominent feature of the stock market for the greater part of the past week. Steel common and Gulf States advanced notably, while the car equipment stocks showed conspicuous strength. In the past day or two, however, the threat of a general railroad strike caused apprehension and values receded. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com.	26½ - 28⅝	Int. Har. Corp., com.	77
Allis-Chal., pref.	85⅝ - 86⅞	La Belle Iron, com.	84 - 88
Am. Can, com.	44¼ - 47¾	Lackawanna Stl.	83⅛ - 87
Am. Can, pref.	106⅞ - 109	Lake Sup. Corp.	21 - 24
Am. Car & Fdry., com.	65¼ - 70½	Lima Loco	57½ - 58½
Am. Loco., com.	70 - 73¼	Lukens, com.	40 - 45
Am. Loco., pref.	104	Lukens, 1st pref.	99½ - 100
Am. Rad., com.	300* - 440	Midvale Steel	56⅛ - 58¾
Am. Ship, com.	62 - 64	Nat.-Acme	33¾ - 35¼
Am. Ship, pref.	95	Nat. Enam. & Stm., com.	33½ - 36
Am. Steel Fdries.	63¼ - 65	Nat. Enam. & Stm., pref.	98 - 101
Bald. Loco., com.	52 - 55⅝	N. Y. Air Brake	145 - 148
Bald. Loco., pref.	102	Pitts. Steel, pref.	101 - 101½
Beth. Steel, com.	139 - 147	Pressed Stl., com.	78½ - 81¼
Beth. Steel, class B	112½ - 118⅜	Ry. Steel Spring, com.	51½ - 52⅝
Can. Car & Fdry., com.	30	Republic, com.	78 - 82¾
Carbon Steel, com.	90	Republic, pref.	102⅜ - 103⅞
Case (J. I.), pref.	85	Sloss, com.	63⅛ - 67
Central Fdry., com.	16½	Superior Steel	31¼
Charcoal Iron, com.	8	Superior Steel, 1st pref.	97½ - 99
Charcoal Iron, pref.	65⅝	Transue-Williams	44¼ - 45½
Chic. Pneu. Tool	68¼ - 69	Un. Alloy Steel	45¼ - 48
Colo. Fuel	46 - 49	U. S. Pipe, com.	20¼ - 21½
Cruc. Steel, com.	64⅝ - 68⅝	U. S. Pipe, pref.	57¼
Cruc. Steel, pref.	112 - 114	U. S. Steel, com.	109½ - 113¾
Driggs-Seabury	50 - 53¾	U. S. Steel, pref.	117⅝ - 118¼
Gen. Electric	163⅝ - 166½	Va. I. C. & Coke	59 - 62
Gt. No. Ore Cert.	33¾ - 37⅛	Warwick	9¼ - 9½
Gulf States Steel.	114 - 130	Westing. Elec.	49 - 52½
Gulf S. Steel, 1st pref.	106½ - 107		
Harb-Walk. Refrac., com.	159		
Int. Harv. of N. J., pref.	117½		

*Ex. dividend.

Dividends

The American Can Company, regular quarterly, 1¾ per cent on the preferred, payable April 2.

The Bucyrus Company, 1 per cent on the preferred, payable April 2.

The Canadian Locomotive Company, regular quarterly, 2 per cent on the common, payable April 2.

The Dodge Mfg. Company, regular quarterly, 1¾ per cent on the preferred, payable April 1.

The Dominion Iron & Steel Company, regular semi-annual 3½ per cent on the preferred, payable April 2.

The General Fireproofing Company, regular quarterly, 1¾ per cent each on the common and preferred, payable April 1.

The Lackawanna Steel Company, regular quarterly, 1½ per cent on the common, payable March 31.

The Nova Scotia Steel & Coal Company, regular quarterly, 2 per cent on the preferred, payable April 14.

The Poole Engineering & Machine Company, initial dividend, 1½ per cent and extra 3½ per cent, payable April 2.

The Western Electric Company, regular quarterly, 2 per cent on the common and 1½ per cent on the preferred, payable March 31.

The United Engineering & Foundry Company, extra, 2 per cent on the common, payable forthwith.

The International Harvester Company of New Jersey, regular quarterly, 1¼ per cent on the common, payable April 16.

Cave-in at Hoff Mine

At Hoff iron-ore mine, Wharton, N. J., Sunday night, March 4, a cave-in made a hole about 50 ft. in diameter and a small supply room and office was carried from the surface into some of the old abandoned workings. No damage was done to the plant or present mine workings and no one was injured. The loss was about $500.

The Homestead Valve Mfg. Company, Homestead, Pa., announces the appointment of the following to have exclusive representation of the Homestead quarter-turn cock and the Hovalco angle blow-off valve in their immediate vicinities: Queen City Supply Company, Cincinnati, Ohio; Root, Neal & Co., Buffalo, N. Y. They will carry a large stock of Homestead valves, and will also be in a position to quote on all lines of Homestead manufacture.

Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c. Denver, pipe, 76.1c., minimum carload, 46,000 lb.; structural steel and steel bars, 83.6c., minimum carload, 36,000 lb. Pacific coast (by rail only), pipe, 65c.; structural steel and steel bars, 75c., minimum carload, 50,000 lb.; structural steel and steel bars, 80c., minimum carload, 40,000 lb. No freight rates are being published via the Panama Canal, as the boats are being used in transatlantic trade.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 3.60c. to 3.75c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in., on one or both legs	.10
Angles, 3 in. on one or both legs less than ¼ in. thick, as per steel bar card, Sept. 1, 1909	.70
Tees, structural sizes (except elevator, handrail, car truck and conductor rail)	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909	.20 to .80
Deck beams and bulb angles	.30
Handrail tees	.75
Cutting to lengths, under 3 ft. to 2 ft. inclusive	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting to lengths 3 ft. and over.

Plates.—Tank plates, ¼ in. thick, 6 in. up to 100 in. wide, 4.50c., to 5c., base, net cash, 30 days, or ½ of 1 per cent discount in 10 days, carload lots. Extras are:

Quality Extras

	Cents per lb.
Tank steel	Base
Pressing steel (not flange steel for boilers)	.10
Boiler and flange steel plates	.15
"A. B. M. A." and ordinary firebox steel plates	.20
Still bottom steel	.30
Locomotive firebox steel	.50

Marine steel, special extras and prices on application.

Gage Extras

Rectangular, ¼ in. thick, over 6 in. wide to 100 in. wide	Base
Lighter than ¼ in., to 3/16 in., up to 72 in. wide	.10
*Lighter than ¼ in., including 3/16 in., over 72 in. to 84	.20
*Lighter than ¼ in., including 3/16 in., over 84 in. to 96	.30
*Lighter than ¼ in., including 3/16 in., over 96 in. to 100	.40
*Lighter than ¼ in., including 3/16 in., over 100 in. to 102	.45
Lighter than 3/16 in., including No. 8, up to 72 in. wide	.15
*Lighter than 3/16 in., including No. 8, over 72 in. to 84	.25
*Lighter than 3/16 in., including No. 8, over 84 in. to 96	.35
Lighter than No. 8, including No. 10, up to 60 in. wide	.30
Lighter than No. 8, including No. 10, over 60 in. to 64	.35

Up to 72 in. and not less than 10.2 lb. per sq. ft. will be considered ¼ in.
Over 72 in. must be ordered ¼ in. thick on edge, or not less than 11 lb. per sq. ft. to take base price.
Over 72 in. wide, ordered less than 11 lb. per sq. ft., down to weight of 3/16 in., take price of 3/16 in.
Over 72 in., ordered weight 3/16 in., take No. 8 price.
Over 72 in., ordered weight No. 8, take No. 10 price.

Width Extras

Over 100 in. to 110 in. inclusive	.05
Over 110 in. to 115 in. inclusive	.10
Over 115 in. to 120 in. inclusive	.15
Over 120 in. to 125 in. inclusive	.25
Over 125 in. to 130 in. inclusive	.50
Over 130 in.	1.00

Length Extras

Universal plates 80 ft. long up to 90 ft. long	.05
Universal plates 90 ft. long up to 100 ft. long	.10
Universal plates 100 ft. long up to 110 ft. long	.20

Cutting Extras

No charge for rectangular plates to lengths 3 ft. and over.	
Lengths under 3 ft. to 2 ft. inclusive	.25
Lengths under 2 ft. to 1 ft. inclusive	.50
Lengths under 1 ft.	1.55
Circles 3 ft. in diameter to 100 in.	.30
Circles over 100 to 110 in. (width extra)	.35
Circles over 110 to 115 in. (width extra)	.40
Circles over 115 to 120 in. (width extra)	.45
Circles over 120 to 125 in. (width extra)	.55
Circles over 125 to 130 in. (width extra)	.80
Circles over 130 in. (width extra)	1.30
Circles under 3 ft., to 2 ft., inclusive	.55
Circles under 2 ft., to 1 ft., inclusive	.80
Circles under 1 ft.	1.85
Half circles take circle extras.	
Sketches not over four straight cuts, inc. straight taper	.10
Sketches having more than four straight cuts	.20
Plates sheared to a radius take complete circle extras.	

*Including extra for width.

Wire Rods.—Including chain rods, $80 to $85.

Wire Products.—Prices to jobbers, effective March 5: Fence wire Nos. 6 to 9, per 100 lb., terms 60 days or 2 per cent discount in 10 days, carload lots, annealed, $3.15; galvanized, $3.85. Galvanized barb wire and staples, $4.05; painted, $3.35. Wire nails, $3.20. Galvanized nails, 1 in. and longer, $2.20 advance over base price; shorter than 1 in., $2.70 advance over base price. Cement-coated nails, $3.10. Woven wire fencing, 51 per cent off list for carloads, 50 off for 1000-rod lots, 49 off for less than 1000-rod lots.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card in effect from March 5, 1917, all full weight:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	53	26½	⅛ and ¼	42	15
½	57	42½	⅜	43	16
¾ to 3	60	46½	½	47	29
			¾ to 1½	50	36

Lap Weld

2	53	40½	1¼	36	21
2½ to 6	56	43½	1½	42	34
7 to 12	53	39½	2	43	29
13 and 14	43½	..	2½ to 4	45	32
15	41	..	4½ to 6	45	32
			7 to 12	44	31

Reamed and Drifted

1 to 3, butt	58	44½	¾ to 1½, butt	45	28
2, lap	51	38½	1¼, lap	31	15
2½ to 6, lap	54	41½	1½, lap	37	22
			2, lap	38	23
			2½ to 4, lap	41	26

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	49	31½	⅛, ¼ and ⅜	42	25
½	54	41½	½	47	34
¾ to 1½	58	45½	¾ to 1½	51	36
2 to 3	59	46½			

Lap Weld, extra strong, plain ends

2	51	39½	1¼	38	23
2½ to 4	54	42½	1½	43	29
4½ to 6	53	41½	2	45	32
7 to 8	49	35½	2½ to 4	47	35
9 to 12	46	30½	4½ to 6	46	34
			7 to 8	40	28
			9 to 12	35	23

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized, but in some sections of the country discounts on less than carloads are three (3) points less (higher price) than the carload discount on both black and galvanized steel pipe.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are four (4) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are five (5) points lower (higher price).

Boiler Tubes.—Discounts on less than carloads freight to be added, effective from Nov. 1, 1916, except 3 to 4½ in. steel from Nov. 20, are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1½ in.	31	1½ in.	23
1¾ and 2 in.	43	1¾ and 2 in.	35
2¼ in.	40	2¼ in.	32
2½ and 2¾ in.	46	2½ and 2¾ in.	38
3 and 3¼ in.	46	3 and 3¼ in.	43
3½ to 4½ in.	46	3½ to 4½ in.	44
5 and 6 in.	45	5 and 6 in.	37
7 to 13 in.	42	7 to 13 in.	34

Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets.—Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net, or 2 per cent discount in 10 days:

Blue Annealed Sheets

	Cents per lb.
Nos. 3 to 8	5.00 to 5.25
Nos. 9 to 12	4.75 to 5.00
Nos. 13 to 16	4.50 to 4.75

No. 17 and lighter gages are based on $4.75 per 100 lb. for No. 28 Bessemer black sheets.

Box Annealed Sheets, Cold Rolled

Nos. 17 to 21	4.80 to 5.30
Nos. 22 and 24	4.85 to 5.35
Nos. 25 and 26	4.90 to 5.40
No. 27	4.95 to 5.45
No. 28	5.00 to 5.50
No. 29	5.05 to 5.55
No. 30	5.15 to 5.65

Galvanized Sheets of Black Sheet Gage

Nos. 10 and 11	6.00 to 6.25
Nos. 12 to 14	6.10 to 6.35
Nos. 15 and 16	6.35 to 6.60
Nos. 17 to 21	6.40 to 6.65
Nos. 22 and 24	6.55 to 6.80
Nos. 25 and 26	6.70 to 6.95
No. 27	6.75 to 7.00
No. 28	7.00 to 7.25
No. 29	7.15 to 7.40
No. 30	7.30 to 7.55

Tin-Mill Black Plate

Nos. 15 and 16	4.55 to 4.80
Nos. 17 to 21	4.60 to 4.85
Nos. 22 to 24	4.65 to 4.90
Nos. 25 to 27	4.70 to 4.95
No. 28	4.75 to 5.00
No. 29	4.80 to 5.05
No. 30	4.80 to 5.05
Nos. 30½ and 31	4.85 to 5.10

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

Mar.	Copper, New York Lake	Copper, New York Electrolytic	Tin, New York	Lead New York	Lead St. Louis	Spelter New York	Spelter St. Louis
7	36.50	36.50	54.25	9.50	9.50	10.87½	10.62½
8	36.50	36.50	54.25	9.50	9.50	10.87½	10.62½
9	36.25	36.25	53.62½	9.50	9.50	10.87½	10.62½
10	36.25	36.25	....	9.50	9.50	10.87½	10.62½
12	36.00	36.00	53.50	9.50	9.50	10.87½	10.62½
13	36.00	36.00	53.50	9.50	9.50	10.75	10.50

NEW YORK, March 14, 1916.

Copper is a little lower but quiet. Tin is easier, especially spot. Lead is unchanged with the tendency easier and anxiety less. Spelter is dull with little change. A waiting attitude on the part of both buyers and sellers still prevails in all the metals. Antimony is quiet and unchanged.

New York

Copper.—The market is slow and drifting. The entire situation is difficult, which is also true of lead. Some business has been done but the volume has not been large and sellers are few. Sales have been made for April delivery at 36c. and for March at 36.50c.; electrolytic copper has been sold for the last half at 31c., all New York. The Government bought 100 tons of electrolytic last Friday for delivery March 15 at Washington for 35c. Lake copper producers are sold up for months to come. A strike at the Laurel Hill refinery of the Nichols Copper Company is a disturbing element, with no settlement yet in sight. The quotation on spot electrolytic and also Lake ranges from 36c. to 36.25c.; April stands at 35.50c. to 36c.; May at about 35c. and June at 34c. For third quarter 31c. to 31.50c. is asked with last quarter at about 30.50c. The London market for spot electrolytic is unchanged at £151. Copper exports to March 13, inclusive, were 12,506 tons.

Tin.—There is less anxiety as to the possibility of tin arrivals being interfered with by submarine activity, no tin-laden vessels having been reported lost so far. The market has eased off since last week and spot Straits tin was quoted at 53c. against 54c. a week ago. The latter part of last week the market was stagnant with the demand light and less than 100 tons sold. On Monday dullness prevailed with sales for the day about 100 tons, mostly Eastern shipment, at 47c. Spot tin was dull with no sellers or buyers. Yesterday the pressure sent the market down to 53c. for spot with sales of about 100 tons, mostly all spot material. More offers were not accepted at 53c. The easing in spot tin is attributed to two causes: The announcement by the American Smelting & Refining Company that the output of its new electrolytic tin plant at Perth Amboy would reach 18,000 tons per year by July 1, and the threatened railroad strike which would tie up tin, thus prompting houses to let it go now and get the money. The promised achievements of the new domestic tin plant are doubted in some quarters because of the possible difficulty in securing enough Bolivian ore. Tin arrivals have been 1415 tons with the quantity afloat placed at 3816 tons.

Spelter.—March spelter eased a little yesterday and is now quoted at about 10.50c., St. Louis, with the New York quotation about 10.75c., at which a few sales were made. April is quoted at about 10.25c., with 10c. asked for second quarter. Not much further change is expected because demand is poor with little prospect of betterment. Unless ore weakens it is claimed the market cannot sag much. The situation is disappointing on the whole, as at this season the market is usually more active. Exports of spelter thus far this month have been 6416 tons.

Lead.—The arrivals since last Saturday have been heavy and the anxiety about supplies has consequently decidedly lessened. In fact, sellers are putting out feelers for business. A week ago spot lead was quoted at 10.50c. to 11c. and some was reported sold at 11.50c. Last week was generally quiet, but as the congestion on the railroads has become universally better the strained situation as to spot lead has diminished until yesterday spot lead at 10c. found no takers. It is believed by some that the present premiums above the American Smelting & Refining Company's price of 9c. will be wiped out soon. Late in the week there was more demand for April and less for March lead and resale lead was offered and sold at St. Louis at 9.75c. Spot lead is quoted at 10c., while March ranges from 9.50c. to 9.52c. April is about 9.25c., and May about 9c. Only 13 tons has been exported this month. The London quotation for spot is the same as last week at £30 10s.

Antimony.—The market is quiet at about 31c. nominal for spot Chinese and Japanese grades. It is, however, hard to obtain.

Aluminum.—Virgin aluminum, 98 to 99 per cent pure, is nominal at 58c. to 60c. per lb.

Old Metals.—The market maintains its strength. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible	33.00 to 34.00
Copper, heavy and wire	32.50 to 32.75
Copper, light and bottoms	27.00 to 27.50
Brass, heavy	20.00 to 20.50
Brass, light	15.75 to 16.00
Heavy machine composition	26.50 to 27.00
No. 1 yellow rod brass turnings	20.50 to 21.00
No. 1 red brass or composition turnings	23.00 to 24.00
Lead, heavy	9.00
Lead, tea	8.50
Zinc	9.00

Chicago

MARCH 13.—Conditions in the metal market are somewhat easier, though Lake and electrolytic copper are still strongly held. Casting copper can be had at lower prices. Tin and spelter are somewhat easier. We quote: Casting copper, 34.50c.; Lake copper, 36.50c.; tin, carloads, 53.50c., and small lots, 55c.; lead, 9.75c. to 10c.; spelter, 10.75c.; sheet zinc, 21c.; Cookson's antimony, 50c.; other grades, 34c. to 35c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 29c.; copper bottoms, 26c.; copper clips, 28c.; red brass, 25c.; yellow brass, 18.50c.; lead pipe, 8c.; zinc, 8c.; pewter, No. 1, 32c.; tinfoil, 40c.; block tin pipe, 45c.

St. Louis

MARCH 12.—Metal prices continue strong. Lead in carload lots is quoted at 9.75c. and spelter at 10.75c. In less than carload lots: Lead, 10.50c.; spelter, 11.25c.; tin, 55.50c.; Lake copper, 37c.; electrolytic copper, 36.50c.; Asiatic antimony, 34c. In the Joplin district zinc blende is steady at $80 to $90 per ton with the average for the week $86; calamine, $48 to $55, with the average $48; lead ore, $122.50, with the average for the week $121. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 12.50c.; heavy yellow brass, 13.50c.; heavy red brass and light copper, 19.50c.; heavy copper and copper wire, 23c.; pewter, 25c.; tinfoil, 36c.; tea lead, 3.50c.; zinc, 7c.; lead, 5.50c.

The Russian Government, according to a report of a Petrograd correspondent of a Paris paper, has elaborated a big project for the development of the Russian and Siberian railroads. The new scheme contemplates the construction of an additional 40,000 miles of railroads, at the rate of 4000 miles per year, over a period of 10 years. In connection with this plan the creation of several large government steel plants and special training establishments is said to be necessary. The work will be commenced at once after peace is declared.

The J. R. Stone Tool & Supply Company, Goebel Building, Detroit, has taken over the sale of products manufactured by the Greaves & Klusman Tool Company, Cincinnati, and will act as the latter's exclusive representative in eastern Michigan (Detroit territory).

The American Railway Engineering Association will hold its eighteenth annual convention at the Congress Hotel, Chicago, March 20 to 22, inclusive.

PERSONAL

Andrew Fletcher, New York, president American Locomotive Company, was elected a director of the Bucyrus Company, South Milwaukee, Wis., at the annual meeting, March 5, to fill the vacancy caused by the resignation of Gates W. McGarrah, president Mechanics & Metals National Bank, New York. Other officers and directors were re-elected as follows: Chairman of the board, H. P. Eells; president, William W. Coleman; vice-president, E. K. Swigart; secretary, G. A. Morrison; treasurer, D. P. Eells; general counsel, Mitchell D. Follansbee. Directors, W. H. Marshall, A. H. Lockett, D. E. Pomeroy, H. H. Dean, J. B. Terbell, W. A. Merriman, New York; E. H. Steedman, St. Louis; J. H. Tweedy, Jr., William Bigelow, Milwaukee.

Allan A. Templeton, president Detroit Seamless Tube Company, has been elected president of the Detroit Chamber of Commerce. E. P. Johnson, Detroit Screw Works, and Henry W. Hoyt, Great Lakes Engineering Works, were elected vice-presidents.

E. C. Bishop, Indianapolis, has bought an interest in the Crawford & McCrimmon Company, operating a foundry and machine shop at Brazil, Ind., and will be at the head of the cost-keeping department. George W. Fagin, Indianapolis, has been appointed superintendent of the foundry.

At Baltimore, March 9, Edward N. Rich, of that city, was elected president of the Alabama Company, succeeding J. William Middendorf, who had been president since the reorganization of the Alabama Coal & Iron Company, predecessor of the present corporation.

Joseph T. Ryerson & Son, Chicago, announce in connection with the readjustment of the departments heretofore under the direction of the late Edward T. Hendee the following appointments: C. E. Pynchon, manager of sales in the machinery department, including domestic and export, and Howard Gray, manager of sales in the railroad department.

Robert S. Alter is vice-president and foreign manager of the American Tool Works Company, Cincinnati, and not secretary and export manager, as stated in a recent issue of THE IRON AGE.

Thomas S. Brenholtz, formerly master mechanic of the American Iron & Steel Mfg. Company, Lebanon, Pa., has been appointed chief engineer of the Penn Iron Company, Lancaster.

Frank H. Smiley has been appointed sales manager of the Pittsburgh Steel Stamp Company, Pittsburgh. This company has recently largely increased its capacity.

L. H. Allen has retired as assistant secretary and assistant treasurer of the Baird Machine Company, Pittsburgh, and has been succeeded in both positions by W. E. Gnann.

C. H. Hunt, for several years chief engineer of the William Tod Company, Youngstown, Ohio, has resigned to accept the position of chief constructing engineer for the Phillips Sheet & Tin Plate Company, Weirton, W. Va., effective March 15.

Benjamin F. Wood, for 16 years electrical engineer with the Pennsylvania Railroad and for the past three years vice-president and chief engineer of the United Gas & Electric Engineering Corporation, 61 Broadway, New York, announces the organization of B. F. Wood Engineers, Inc., Woolworth Building, New York, to design and supervise engineering works in power development, industrial plants, etc.

George Evans, formerly electrical engineer with the Valley Mold & Iron Company, Sharpsville, Pa., has been appointed superintendent of the new ingot mold plant of the Penn Mold & Mfg. Company, Canal Dover, Ohio.

J. A. Campbell, president Youngstown Sheet & Tube Company, Youngstown, Ohio, is taking a month's vacation at Hot Springs, Ark.

L. J. Campbell, a vice-president of the Youngstown Sheet & Tube Company, has been appointed chairman of the Youngstown district of the Military Training Camps Association. This district includes Mahoning, Trumbull and Columbiana counties.

E. W. Woodford, now assistant credit manager of the Youngstown Sheet & Tube Company, has been appointed treasurer of the Continental Supply Company, a subsidiary, with principal offices in St. Louis, where Mr. Woodford will be located after March 20. He succeeds L. L. Loesser, who resigned on account of ill health.

Reese M. Price has been appointed chief clerk of the Youngstown Sheet & Tube Company, succeeding Walter Meub, who has been appointed private secretary to J. A. Campbell, president.

Sir Robert Hadfield has offered, through the Council of the Institution of Mechanical Engineers (British), £200 to provide a prize or prizes for a new and accurate method of determining the hardness of metals.

R. M. Hoffman has recently been appointed manager of sales of the Hesse-Martin Iron Works, Portland, Ore. He is a mechanical engineer, and has been connected with the Meese & Gottfried Machinery Company in both its Seattle and Vancouver plants.

Robert L. Arms, for several years connected with the sales department of Manning, Maxwell & Moore, has engaged with the Sherritt & Stoer Company, 603-604 Finance Building, Philadelphia, as assistant to the general manager.

C. E. Sharp, formerly master mechanic at the Midvale Steel Works, has accepted a similar position with the Lukens Steel Company, Coatesville, Pa.

J. Lawrence Swayze, manager of the Reading plant of the American Iron & Steel Mfg. Company, has been appointed superintendent of the bolt and nut plants of the company, now a property of the Bethlehem Steel Company, at Lebanon, Pa. He has been succeeded at the Reading plant by W. H. Castner.

W. E. Wolfram, who recently resigned as superintendent of the projectile department of the Bethlehem Steel Company, has been presented with a diamond-studded watch charm, gold chain and knife by his former employees and associates.

William Langdon, formerly connected with the Michigan Stove Company and later with the Hayes Wheel Company, Detroit, has become assistant purchasing agent of the Willys-Overland Company, Toledo, Ohio, and will have charge of the buying of steel and other metals.

Robert D. Meacham, traffic manager of Rogers, Brown & Co., sailed from New York March 12 on the Rochambeau for six months' service as an ambulance driver in France with the American Ambulance Corps.

Arthur I. Jacobs, for seventeen years in charge of the water and electric light departments of St. Louis, has joined the research department of the Powdered Coal Engineering & Equipment Company, Chicago.

A. E. Johnson, engineer, Dominion Bridge Company, Montreal, Canada, is visiting New York in connection with some large contracts.

Fred N. Hait, formerly commercial agent in the Pittsburgh district for the Lehigh Valley Railroad, has resigned to assume on April 1 the position of secretary and treasurer of the Ohio Mold & Foundry Company, manufacturing ingot molds. He will also be head of the company's sales department, which will be operated under the name of the Hait-Robinson Company, with headquarters in Pittsburgh.

Francis Bird Dutton, formerly general manager of the Pennsylvania Steel Company's Lebanon plant, has associated himself with the American Grondal Company, 120 Broadway, New York, and will have charge of all its technical work. This embodies the Grondal wet magnetic separator, the Grondal briquetting kiln and, under certain circumstances, the Greenawalt sintering process. The Pennsylvania Steel Company operated a concentrating mill at Lebanon, using the Grondal separators. Mr. Dutton is not only familiar with this operation but with the other magnetic concentration operations in the country.

Pittsburgh and Nearby Districts

The Sligo Iron & Steel Company, incorporated under the laws of Delaware, has been organized and has purchased the rolling mill at Connellsville, Pa., which has a 9-in. guide mill, a 16-in. bar mill and a 24-in. plate mill, rolling both iron and steel products. An office will be maintained at 308 Union National Bank Building, Pittsburgh. The company is making quotations and states it is in position to make fairly prompt shipments on merchant iron and steel bars. James Ward, Jr., is president; James R. Dodworth, treasurer; W. W. Darley, secretary; Richard Irvin, vice-president and general manager, and Joseph McConnell, second vice-president and superintendent in charge of mills.

The electrical development committee, of which Stewart C. Coey, of the Youngstown Sheet & Tube Company, Youngstown, Ohio, is chairman, will have charge of the meeting of the Association of Iron and Steel Electrical Engineers, March 17, at the Fort Pitt Hotel, Pittsburgh. The standardization committee, of which W. T. Snyder, electrical engineer, National Tube Company, Pittsburgh, is chairman, will have charge of the meeting of the Pittsburgh Section of the Society on April 21.

The McKenna Brass & Mfg. Company, incorporated with a capital of $400,000, will take over the business of the McKenna Bros. Brass Company, one of the oldest brass manufacturing concerns in Pittsburgh. McKenna Brothers will continue to sell under that name the products of the Vanadium-Alloys Steel Company, Latrobe, Pa., consisting of high-speed carbon and alloy steels, and also the products of the Latrobe Tool Company, consisting of high-speed drills, bridge reamers and reamer drills. The incorporators of the McKenna Brass & Mfg. Company are F. Morrison McKenna, C. H. McKenna and T. S. McKenna.

It is expected that on March 29 all the plants and assets of the Westinghouse Machine Company at East Pittsburgh will be formally taken over by the Westinghouse Electric & Mfg. Company. The negotiations were started about two years ago by the Electric Company, proposing a share exchange basis at the rate of one share of Electric Company stock for three shares of Machine Company stock. The proposition was accepted and since that time the Electric Company has been gradually acquiring the stock of the Machine Company, and is now practically the owner of the entire capitalization, which amounted to $10,000,000. It is understood that when the Electric Company completes its new plant at Essington, near Philadelphia, the Machine Company will be moved there, and the present works of the Machine Company at East Pittsburgh will be transformed into an adjunct of the Electric Company's shops.

The Riter-Conley Company, Pittsburgh, is buying a large quantity of punching and shearing machinery for its plant at Fairfield, Md.

The Reynolds Machine Mfg. Company, Massillon, Ohio, recently incorporated with a capital of $200,000, will manufacture automatic screw-driving machines. Floyd C. Snyder is president; Oliver F. Binford, secretary and treasurer; E. N. Birney, vice-president, and G. D. Reynolds, general manager.

The James McKay Company, Pittsburgh, maintains an office in charge of John A. Buchanan in the King Edward Hotel in Toronto, Canada. The company is selling a large part of its output in Canada, comprising mechanical, marine and stud-link marine chain, anchor shackles, hooks, etc., and commercial and special forgings.

A statement has been issued by Severn P. Ker, president Sharon Steel Hoop Company, Sharon, Pa., relative to the acquiring of the plants of the Youngstown Iron & Steel Company, Youngstown, Ohio. He says there will be an issue of bonds to the extent of $2,000,000 to carry out the deal, these bonds having been underwritten by the Farmers' Deposit National Bank, Pittsburgh. Practically the entire capital stock of the Youngstown Iron & Steel Company has been purchased by the Sharon Steel Hoop Company at $200 per share. The main offices will remain in Sharon, Pa., and the company will continue to operate the plants at Sharon and Youngstown under the name of the Sharon Steel Hoop Company. The offices of the two concerns will be consolidated in Sharon about April 1.

On Sunday night, March 11, the power plant of the Westinghouse Machine Company, East Pittsburgh, was somewhat damaged by fire. It will be idle only a short time. The fire is said to have been caused by crossed electric wires.

Between April 15 and May 1 the offices of the H. Koppers Company, builder of Koppers by-product coke ovens and recovery plants, will be removed from the First National Bank Building to the new Frick Arcade Building on Fifth Avenue, Pittsburgh, now nearly completed. The company will occupy one entire floor and part of another, comprising a total of 37,581 sq. ft.

OBITUARY

PETER IGOE, SR., president of Igoe Brothers, Inc., manufacturer of wire nails and wire, died March 5 at his home in Brooklyn, N. Y., following an operation, aged 84 years. He was born in County Longford, Ireland, and came to this country when a boy, locating at Belleville, N. J. He was first employed as a wire worker in the local wire factory, then owned by Peter Cooper and afterward operated by the De Witt Wire Cloth Company. He was employed subsequently in the same capacity in Western mills, and in 1887 became superintendent of a large wire and nail mill at Newcastle, Pa. He remained there until 1900, when he removed to Brooklyn, identifying himself actively with his sons, who had established a business some years previously under the name of Igoe Brothers. In 1904 another wire and nail factory was established by the same interests in Newark, N. J., and is now conducted by Igoe Brothers, Inc. Mr. Igoe was continuously engaged in the wire business for over 65 years and was probably the oldest practical wire man in the country.

CHARLES A. LAWTON, for many years in the foundry business at Depere, Wis., died March 9 at Nassau, Bahama Islands, where he was spending the winter, aged 72 years. On the day before a cable announcing his death was received a letter reached the family at Depere, in which was recounted Mr. Lawton's heroism in rescuing an aged man from drowning in the surf. He retired from active direction of his foundry and machine-shop interests several years ago.

CLINTON A. HAMILTON, formerly general manager of the Brown-Corliss Engine Company, Corliss, Wis., and later president of the Racine Mfg. Company and manager of the Lavigne Gear Company, died March 12. He leaves his widow, a son and three daughters.

WILLIAM G. DODD, president National Lock Washer Company, Newark, N. J., died March 12 from apoplexy, aged 46 years. He was unmarried.

FREDERICK C. BUDDEN, treasurer Hay-Budden Mfg. Company, anvils, Brooklyn, N. Y., died Feb. 23.

Through the courtesy of B. F. Fackenthal, Jr., former president Thomas Iron Company, we are advised that at the funeral services of Edgar S. Cook, held at his late home in Redlands, Cal., March 6, the following, all of whom were of course present, served as honorary pall bearers: Harry G. Dalton, W. P. Murray and Charles D. Hatch, of Cleveland; Prof. Richard W. Lodge, Boston; Albert Broden, Temple, Pa.; W. S. Pilling, Philadelphia; B. F. Fackenthal, Jr., Riegelsville, Pa.; J. W. Gallagher, representative United States Steel Products Company, Shanghai, China. The remains of Mr. Cook were taken to Pottstown, Pa., for interment.

United States civil service examinations are announced for mechanical draftsmen, vacancies occurring at the Naval Torpedo Station, Newport, R. I. Application should be made for form 1312 to the Civil Service Commission, Washington, D. C.

Machinery Markets and News of the Works

DOMESTIC TRADE AIDED

War Crisis Diverts Tools to Home Use

Strong Inquiry for Single Tool and Small Lots—Foreign Requirements Still Coming In—Canadian Market More Active

Machine tools built for export have been turned over in large quantities to customers in this country. By this method the trade all around has benefited and the embargo on transatlantic shipment has decidedly improved domestic deliveries.

The demand for single tools and small lots is everywhere active. The hesitancy about closing for requirements, however, which has been in evidence now several weeks, still holds up the placing of many orders. A clearing up of the national crisis is needed to release this business.

Many munition contracts are now being completed, and more of the equipment engaged on this work has been put upon the market. Much of it is said to be unfit for fine work. Shipments can also be made now more generally from stock, although delivery on standard types is still several months off. So far these factors have had no marked effect on the demand for new machinery.

Less stress is laid this week on the railroad congestion, although it is reported from Milwaukee that deliveries east of Chicago are very slow. The automobile makers at Detroit have met the situation by delivering their cars under their own power as far west as Denver.

On account of the uncertainties of the export trade little or no business of this character is being placed; but inquiry from abroad is good.

Canadian machinery market conditions are slightly better than earlier in the year; but deliveries are slow and price advances are looked for.

Shops in the Northwest are extremely busy on the production of auxiliary equipment for ships and are extending their plants and running day and night to keep up with orders.

New York

NEW YORK, N. Y., March 13, 1917.

Machine tools intended originally for shipment abroad have been diverted in large quantities to customers in this country. Domestic deliveries have improved markedly for this reason. Most tool builders are now able to take orders against equipment in stock, except on special types that are always in strong demand even in less strenuous times.

Local dealers are doing a very good domestic business, and that market shows no noticeable change from recent weeks. Inquiry remains strong. If anything, on some lines, such as turret lathes and screw machines, it is better. Buyers show an inclination, however, to withhold placing business in view of the possibility of this country being drawn into war.

Little or no export business is now being contracted for, pending a clearing up of the shipping situation. A good inquiry is coming, nevertheless, from abroad; and is much more satisfactory nowadays in that irresponsible parties have been practically forced out.

Munition plants are now, to an even greater extent than ever, completing their contracts for shell work and are releasing much second-hand equipment. Large plants of this character in Connecticut and at Philadelphia have recently taken this action. This trend of the market is not at present affecting the demand for new tools, which holds strong.

The railroads are not buying to any extent worth talking about. The Union Pacific, however, is still placing orders against a large list of requirements covering its needs for its entire system.

The National Gear Corporation, 18 Hunters Point Avenue, Long Island City, N. Y., is purchasing about 12 tools, among them several large turrets and screw machines.

The Duplex Engine Governor Company, 36 Flatbush Avenue Extension, Brooklyn, N. Y., closed recently for a number of machines.

The Joseph Joseph & Brothers Company, Woolworth Building, New York, is in the market for an 8-wheel, 15 or 20-ton crane with 40 to 50-ft. boom, second-hand, in good condition.

The Acorn Screw Company, 826 Boulevard, Bayonne, N. J., is in the market for a 16 to 24-in. shaping machine, a 1½-in. universal milling machine and an 18 to 24-in. swing lathe, single pulley drive preferred.

The Kerr Turbine Company, Wellsville, N. Y., will purchase a No. 3, 4 or 5 Schuchardt & Schutte gear-hobbing machine. Offer should be accompanied by full information and photograph. C. R. Gould is purchasing agent.

S. H. Wilcox & Co., Woolworth Building, New York, is seeking a 500-hp. or larger alternating current slip ring motor for a 440-volt, three-phase, sixty-cycle current, to make 900 r.p.m.

The Unique Art Mfg. Company, 60 Shipman Street, Newark, N. J., will purchase an electric butt welding machine for small wire work and a standard type 25-hp. gas engine.

Mosses, Pope & Messer, Inc., 366 Fifth Avenue, New York, are in the market for two 125 to 150-hp. return tubular boilers for 100-lb. working pressure, one 125-hp. Corliss engine, one single-acting plunger type 8 x 6 x 8-in. boiler feed steam pump and other special equipment.

The Rome Mfg. Company, Rome, N. Y., manufacturer of brass goods, is having preliminary plans drawn by F. W. Kirkland, 103 Dominick Street, Rome, for a two-story factory building, 50 x 310 ft., and a one-story office building, 60 x 110 ft. E. L. Spriggs is superintendent.

The Pollard Mfg. Company, Ltd., Niagara Falls, N. Y., manufacturer of stone and marble-working machinery, electric hoists and derricks, has been formed to represent the Canadian company of the same name in this country. It has not been decided whether it will take up an existing plant or build its own works. The officers and personnel will be the same for both organizations. The headquarters of the company are at Niagara Falls, Ont.

The Titanium Alloy Mfg. Company, Sugar and Lafayette streets, Niagara Falls, N. Y., has let contract to the Peckham Construction Company, Mutual Life Building, Niagara Falls, for the erection of additional two-story buildings estimated to cost $75,000.

The Keystone Machine Company, recently incorporated with a capital stock of $10,000 to manufacture special machinery, tools, dies, metal specialties and stampings, has taken over a plant at 206 Commercial Street, Rochester, N. Y. C. R. Seymour is president, W. H. Seymour, vice-president and R. W. Arthur is secretary and treasurer.

The Lehigh Valley Railroad, 143 Liberty Street, New York, has awarded contract to Westinghouse Church Kerr & Co., Inc., 37 Wall Street, New York, for the construction of a reinforced concrete engine house at East Buffalo, a 15-stall addition to the engine house at Tifft Farm, together with new machine shops, power house, etc. A gantry crane will be installed at East Buffalo to remove ashes. The present engine house in part will be converted into an annex containing blacksmith, machine and boiler shops, equipped with a complete assortment of tools. The size of the present boiler plant will be trebled. A power house will be added at Tifft Farm and will contain machine and blacksmith shops. A mechanical coaling plant will be added later on. Electrically oper-

ated apparatus will be installed in the engine houses wherever possible.

The Buffalo Sled Company, North Tonawanda, N. Y., has increased its capital stock from $75,000 to $300,000 to take care of its greatly enlarged business. The company manufactures an auto-wheel coaster wagon, steering sleds and snow shovels.

The Atlas Crucible Steel Company, Dunkirk, N. Y., manufacturer of tool steels, is putting up a small addition to its gas producer plant and is adding one story to its electric steel melting department. D. W. Lathrop is vice-president.

The Cataract Refining & Mfg. Company, Marine National Bank Building, Buffalo, N. Y., manufacturer of lubricating products, has increased its capital stock from $250,000 to $500,000, because of the increased business, cost of manufacture and materials, together with plant enlargements which it is making at both its Buffalo and Chicago plants. H. C. Hutchins is vice-president.

The International Banding Machine Company, 257 West Seventeenth Street, New York, has increased its capital stock from $400,000 to $500,000 to provide for manufacturing purposes. Isidor Steiner is president.

The A. W. Wheaton Brass Works, Newark, N. J., recently incorporated its business with a capital stock of $40,000. There has been no change in the management. The company is now established in its new plant at Walnut Street and New Jersey Railroad Avenue. A. W. Wheaton is president and A. W. Wheaton, Jr., is secretary and general manager.

The Semet-Solvay Company, Syracuse, N. Y., manufacturer of retort coke ovens, at a meeting of stockholders on Feb. 27 was authorized to increase its capital stock from $10,000,000 to $20,000,000, of which $2,000,000 will be offered to the stockholders at par, to provide for additional financial requirements of the company. J. G. Hazard is vice-president.

The Continental Can Company, Syracuse, N. Y., has had plans drawn for a two-story addition to its machine shop, 34 x 70 ft.

The American Magnesium Corporation, recently incorporated with a capital stock of 2500 shares of $100 par value and 10,000 shares no par value, to carry on business with $600,000, has established a plant at Niagara Falls, N. Y., and is now producing magnesium ingots. I. R. Edmands is president; E. S. Whitney and George O. Seward are vice-presidents and D. Burgess is secretary and treasurer.

The Newark Tube & Metal Works, Ferry Street, Newark, N. J., manufacturer of steel tubing, has contracted for a one-story addition, 50 x 100 ft.

Carson & Hartwig, Inc., 25 Hackett Street, Newark, N. J., manufacturer of artisans' tools and files, is installing additional equipment to provide for increased operations. The capacity of the file branch of the plant is about 36,000 files weekly. R. C. Carson is president.

The Butterworth-Judson Company, Newark, N. J., manufacturer of chemicals, has filed plans for the erection of four one-story additions to its plant, each 36 x 60 ft., at Avenue R and the Passaic River. A boiler house, 20 x 33 ft., and other smaller structures will also be erected. The estimated cost is $24,000.

The John C. Dolph Company, 178 Emmett Street, Newark, N. J., manufacturer of insulation specialties, has filed plans for improvements to cost about $6,000.

The Tisch Machine Tool & Die Works, 454 Spring Street, Elizabeth, N. J., has been incorporated with a capital of $50,000 by Louis, John H. and George G. Tisch.

The F. H. Kalbfleisch Company, Baltic Street, Elizabeth, N. J., manufacturer of chemicals, has acquired four acres adjoining its plant, with frontage on the Elizabeth River and the Central Railroad of New Jersey, for the erection of new additions.

The Munning-Loeb Company, Church Street, Matawan, N. J., manufacturer of electro-platers' supplies and similar specialties, has increased its capital from $100,000 to $150,000.

The Hurst Air Craft Corporation, Asbury Park, N. J., has been incorporated with a capital of $125,000 by I. A. Bjornstad, Thomas A. Buckingham and R. E. A. DeBow.

The Raritan Copper Works, Perth Amboy, N. J., has awarded a contract to the Berlin Construction Company for a one-story brick and steel addition to cost $15,000.

The Bothamley Chemical & Extract Company, Perth Amboy, N. J., has been acquired by a new company to be known as the United Dyes Corporation, capitalized at $500,000. Extensions and increased operations at the present plant are planned.

Wiegand & Co., 112 Arlington Street, Newark, N. J., jewelry manufacturers, are erecting a two-story building on Springfield Avenue, Irvington, which will include departments for lathe and press work, bench and polishing operations. The structure will be 26 x 140 ft., estimated to cost $15,000.

The Original Brass Refinishing Company, New York, has leased property at 125 Baxter Street for manufacturing work.

The Kislik Brudney Machine & Tool Company, 129 Crosby Street, New York, has acquired property at 136-138 Mott Street for extensions.

The Otis Boiler Company, Oswego, N. Y., has been incorporated with a capital of $25,000 to manufacture boilers and machinery. J. F. Otis, R. A. Downey and A. Kellogg are the incorporators.

The A. J. Deere Company, Hornell, N. Y., has prepared preliminary plans for a two-story factory and blacksmith shop, 40 x 100 ft., which it will erect this spring. A. J. Deere is president.

The H. E. Listman Company, Troy, N. Y., has been incorporated with a capital stock of $100,000 by B. Bailey, J. H. Broderick and H. E. Listman, 151 River Street, Troy, to manufacture motor vehicles and accessories.

The Rome Mfg. Company, Rome, N. Y., is having plans drawn for a two-story factory, 42 x 310 ft., to be erected on Railroad Street. E. L. Spriggs is superintendent.

Barnes, Smith & Co., 178 Water Street, Binghamton, N. Y., are having plans prepared for a manufacturing building 60 x 200 ft., four stories.

The Standard Oil Company, 26 Broadway, New York, has had plans drawn for a manufacturing plant, 101 x 126 ft.; a boiler house, 25 x 43 ft., and an office building, 37 x 55 ft., to be erected at Syracuse, N. Y.

The Camillus Cutlery Company, Syracuse, has completed plans for additions to its plant to cost approximately $50,000.

The Rome Wire Company, Rome, N. Y., will add to its plant on Railroad Street a receiving building, 76 x 100 ft., two stories, and a shipping building, 40 x 60 ft., one story. Contract for the structural steel has been let to the Utica Steam Engine & Boiler Works, Utica. Frank M. Potter is superintendent.

The plant of the Buffalo Non-Ferrous Casting Mfg. Company, Chandler Street, Buffalo, recently damaged by fire, is to be rebuilt at once.

The Columbian Facing Mills Company, Bailey Avenue, and Pennsylvania Railroad, Buffalo, manufacturer of foundry supplies, has purchased a site on the New York Central Railroad at Stone and Greene streets, and will erect a factory and foundry facing mill, 200 ft. in length.

The Hammond Steel Company, Solvay, N. Y., will build an addition to its foundry. Contract for the steel has been let to the Williams Bridge Company, Syracuse.

The Sowers Mfg. Company, engineer and founder, 1300 Niagara Street, Buffalo, has had plans drawn for an addition to its machine shop at Niagara Street and Auburn Avenue.

Ignacio Guerra' C., Calle 62, No. 499 Merida, Yucatan, Mexico, has been appointed chief of the department of hardware and machinery of La Cia de Fomento del Suresta de Mexico, S. A., a new organization fostered by the Yucatan Government for the purpose of urging the interior cities to install lighting systems and modern waterworks. It is proposed to have a collection of different outfits on exhibit in Merida and manufacturers of pumps, internal combustion engines using crude oil, electric generators, and also of steam boilers and engines are invited to send catalogs to Mr. Guerra at the above address. A plan is also under way to investigate the advantages to be obtained by the use of road-rolling machines in repairing the streets of the smaller cities in Yucatan.

Philadelphia

PHILADELPHIA, PA., March 12, 1917.

The International Steel Treating Company, 718 Commercial Trust Building, Philadelphia, Pa., has increased its capital stock from $1,000,000 to $1,250,000 by an addition of $250,000 of 7 per cent cumulative preferred stock. It is the intention of the board of directors to issue only about $100,000 of this stock, the proceeds of which will be devoted to the construction of a concrete and steel building now being erected at its plant at Darby, Pa., which with necessary furnaces and other equipment will cost about $80,000. This building will be completed and in operation probably late in April and will be designed for the commercial heat treatment of steel up to 24 ft. in length. Nathan Spering is chairman of the board of directors.

The Harper Mfg. Company, Sixth Street, Chester, Pa., manufacturer of metallic packing, is about to start the construction of a two-story machine shop, 48 x 110 ft., to cost $10,000, to provide additional manufacturing facilities.

The York Mfg. Company, manufacturer of ice-making and refrigerating machinery, York, Pa., is erecting a one-story

addition to its plant, 20 x 200 ft., for which it has placed equipment orders.

The Rivetless Chain & Engineering Company, Avon, Pa., manufacturer of conveying machinery and drop forgings, is now owned and controlled by the Bearings Company of America, Lancaster, Pa. Jack L. Straub is president of both companies. At the present time the company is very busy with orders for a year in advance. It is adding board drop hammers, cold and hot trimming presses, automatic die sinking machines, etc., to its equipment. This material was contracted for a few months ago, and some of the hammers will be put in operation within a few weeks, specializing on forgings of not over 20 lb.

George W. Swift, Jr., Bordentown, N. J., manufacturer of paper-corrugating and cardboard carton machinery, ticket, tag and card presses, etc., recently incorporated his business with a capital stock of $200,000.

The Philadelphia Gear Works, 1120 Vine Street, Philadelphia, has awarded a contract for the erection of an addition to its plant to the Standard Construction Company, Philadelphia.

The Main Belting Company, 1241 Carpenter Street, Philadelphia, is taking bids for a four-story brick addition to its plant, 53 x 109 ft.

The Scott Paper Company, Seventh Street and Glenwood Avenue, Philadelphia, manufacturer of tissue paper goods, is planning the removal of its entire plant to the site of its present branch factory at Chester. Proposed extensions and additions to this plant are estimated to cost $500,000. E. I. Scott is president.

The Frankford Arsenal, Philadelphia, has taken bids on revised plans for the erection of a steel and concrete artillery case shop. The lowest bid on former plans totaled $55,000.

Joseph Kopperman & Sons, 307-9 Florist Street, Philadelphia, manufacturers of brass and bronze, will build a three-story brick and steel addition, 24 x 32 ft.

Philip Golden, Philadelphia, will build a one-story machine shop, 35 x 65 ft., at 4012-14 Ridge Avenue.

The American Metal Works, 314 Armat Street, Philadelphia, is having plans prepared for further additions to its plant at Germantown, to consist of a three-story structure, 60 x 300 ft. Kern Dodge, Morris Building, Philadelphia, is the engineer.

The Texas Company, Philadelphia, manufacturer of oils, will build a two-story garage and repair shop, 45 x 130 ft., at Tenth and Chelten avenues.

The Edward G. Budd Mfg. Company, Hunting Park and Wissahickon avenues, Philadelphia, manufacturer of automobile parts, will take bids March 19 for an addition to its plant.

The Midvale Steel Company, Philadelphia, has acquired property, consisting of about 7 acres, on Wissahickon Avenue, near Roberts Avenue, for extensions. A contract has been awarded to Barclay, White & Co., 1530 Chestnut Street, for a new machine shop at the Nicetown plant, to be one story, of brick and steel, 65 x 103 ft., to cost about $25,000.

Fire March 9 destroyed the chemical and dye plant of the General Processing Company, Amber Street and Allegheny Avenue, Philadelphia, with loss estimated at $35,000.

The Hess-Bright Mfg. Company, Front Street and Erie Avenue, Philadelphia, manufacturer of bearings and pulleys, has awarded contract for a two-story brick and concrete addition, 100 x 215 ft., to the Harrison C. Rea Company, 1027 Wood Street.

The National Metal Edge Box Company, Philadelphia, has purchased a five-story factory, 1217-1239 Callowhill Street, as a plant for the manufacture of its specialties.

Robert H. Foerderer, Inc., Frankford, Philadelphia, has awarded a contract for a boiler house at its leather plant. It will be of steel and concrete, 52 x 102 ft., estimated to cost $25,000.

The American Radiator Company, Chicago, Ill., a New Jersey corporation with registered office at East Orange, N. J., has filed notice of increase in its capital stock at Trenton, from $12,000,000 to $25,000,000.

The Drake Auto Repair Shop, Trenton, N. J., will remove its plant about May 1 to 15-17 Lafayette Street, having arranged for a new building on this site. The plant will be fully equipped for automobile repair work.

Hersh & Brothers, 715 Yeager Street, Allentown, Pa., operating a sheet-metal works, are installing new machinery for the manufacture of metal automobile parts and mud guards. The company has recently received an order from the Bethlehem Motors Corporation, now building a local plant, for automobile hoods, fenders and mud guards, totaling about $60,000.

Fire March 8 destroyed the wagon and wagon parts manufacturing plant of Thrush & Stough, 11-13 North Washington Street, Shippensburg, Pa., with loss estimated at $25,000.

The Hook Foundry Company, Marcus Hook, Pa., recently organized, has made application for the vacating of street property at the site of its proposed gray-iron foundry. Plans have been prepared for the initial buildings, which with equipment are estimated to cost $150,000.

The Ajax Rubber Company, Trenton, N. J., manufacturer of automobile tires, is equipping its new plant for early operation at full capacity. It will have an output of 3400 tires per day, double the former capacity.

The Bellmark Company, New York Avenue, Trenton, N. J., manufacturer of sanitary earthenware, has filed articles of incorporation with a capital of $150,000 for the operation of the plant. Lloyd H. Rockhill is secretary.

The U. S. Electric Company, Trenton, N. J., has been incorporated to manufacture electric appliances. N. W. Nutt, T. and A. Salamandra, are the incorporators. H. M. Hartmann, 228 Tyler Street, is agent for the company.

The Concrete Steel Company, Camden, N. J., will build a new crane runway at Delaware Avenue and Pearl Street, to cost about $2,000.

The Mack Body Company, Camden, N. J., has been incorporated with a capital of $125,000 to manufacture carriages and wagons. Edward, John and L. E. McLaughlin are the incorporators.

The Sun Shipbuilding Company, Chester, Pa., is taking bids for the erection of a one-story brick and concrete addition, 35 x 65 ft.

New England

BOSTON, MASS., March 10, 1917.

The Greenfield Tap & Die Corporation, Greenfield, Mass., has voted to purchase the business and plants of the F. E. Wells & Son Company, which has three factories in Greenfield and a drop forging plant at Turners Falls. The Nutter & Barnes Company, Hinsdale, N. H., will also be taken over and the business will be brought to Greenfield. The Greenfield Tap & Die Corporation will build on the F. E. Wells & Son property at Sanderson and North streets a central shipping room and will remove its general offices to the second floor of this building. Several other minor changes will be brought about as a result of the consolidation.

The American Brass Company, Waterbury, Conn., is to begin work at once on an addition, 98 x 320 ft., one and two stories, to its plant in Ansonia, Conn. The company has also purchased several parcels of land in the rear of its general office in Waterbury to provide for future expansion.

The Scovill Mfg. Company, Waterbury, Conn., has received another munition order and expects to take back a considerable portion of the 2000 hands laid off last week.

The Gallaudet Aircraft Corporation of New York City is to build at once a plant on Chepiwanoxet Island, Warwick, R. I., where it will manufacture seaplanes and aircraft for the United States Government. The plant and equipment will cost approximately $100,000 and will include a machine shop, 50 x 125 ft., two stories, and an assembling shop, 75 x 150 ft., one story. The company will employ about 200 workmen.

Reed Brothers, South Somerset, Mass., have begun the rebuilding of their shipbuilding plant from private plans.

The Fore River Shipbuilding Corporation, Quincy, Mass., has begun the erection of a storage building and workshop, 20 x 111 ft., two stories, on East Howard Street, Quincy Point.

The Gilbert School, Winsted, Conn., has awarded a contract for a machine shop, 30 x 40 ft., one story, to be built on Main Street.

The Lake Torpedo Boat Company, Bridgeport, Conn., is building an addition, 40 x 100 ft., two stories, to its office building; also an addition, 25 x 59 ft., one story, to a storage building.

Palmer Brothers Engines, Inc., Greenwich, Conn., has been organized with a paid-in capital of $250,000. Frank T. Palmer is president; Everett E. Palmer, vice-president; and Carl A. Hathaway, secretary and treasurer.

The Fenn Mfg. Company, Hartford, Conn., has awarded a contract for a new factory, 50 x 178 ft., with wing, 50 x 194 ft., one story, and a boiler house, 24 x 32 ft. The factory will be built on Broad Street.

The Eastern Foundry Supply Company, Boston, Mass., has been incorporated with authorized capital stock of $20,000 with William T. Nicholson, Providence, R. I., president; George A. Taber, Boston, treasurer; and Lester W. Ingraham, clerk.

The Brown & Sharpe Mfg. Company, Providence, R. I., has awarded a contract for an addition, 50 x 100 ft., three stories.

The Hy-Carbo Steel Company, Lowell, Mass., has been incorporated with authorized capital stock of $20,000. Charles H. Bagshaw, 79 Wedge Street, Lowell, is president and treasurer; Isaac E. Higgins, clerk; and M. C. Bagshaw, a director.

The Hendee Mfg. Company, Springfield, Mass., is to build an addition, 65 x 105 ft., one story, to its plant on State Street.

The Union Metal Goods Company, Pawtucket, R. I., has been incorporated with capital stock of $25,000 by Arthur M. Allen, Frederick W. Tillinghast and Rush Sturgis, Providence.

The Hill Clothes Dryer Company, Worcester, Mass., has been incorporated with authorized capital stock of $10,000. E. H. Carroll is president; George A. Sargent, 333 Park Avenue, Worcester, treasurer; and C. H. Thurston, a director.

The Whitcomb-Blaisdell Machine Tool Company, Worcester, Mass., has awarded a contract for an addition to its foundry, 27 x 102 ft., one story.

The Bridgeport Steel Company, Stratford, Conn., has awarded a contract for a building, 54 x 118 ft., one story.

The Naugatuck Valley Crucible Company, Shelton, Conn., has been incorporated with capital stock of $250,000 by David N. Clark, Shelton; William H. Carpenter, Seymour, Conn.; and Edward W. Kneen, Shelton.

The Sponsel Company, Hartford, Conn., has been incorporated with authorized capital stock of $20,000, to manufacture machinery. The incorporators are Simon E. Geiselman, East Hartford; Charles W. Sponsel and George J. Storner of Hartford.

The Champion Horseshoe Works, Pawtucket, R. I., is to erect a warehouse and office building adjoining its plant on Prairie Avenue. The warehouse section will be 150 x 200 ft., and the office section, 60 x 60 ft.

The North & Judd Mfg. Company, New Britain, Conn., is having plans drawn for a six-story addition.

Baltimore

BALTIMORE, MD., March 12, 1917.

The F. O. Smith Shipbuilding & Dry Dock Company, Norfolk, Va., has awarded contract to Nash & Jones for the following plant improvements to cost, without equipment, $30,000: A two-story machine shop and storeroom, 52 x 125 ft.; a boiler and blacksmith shop, 52 x 100 ft., both equipped with 10-ton traveling cranes. The buildings will be of steel and brick. Benjamin F. Mitchell is the architect. George W. Roper is president and J. R. Seemer is general manager and assistant treasurer.

The Maryland Tube Corporation, Munsey Building, Baltimore, contemplates the erection of a plant on a 26-acre tract at Relay, Md., to make brass and copper tubing and sheets. It will also do a general copper and brass business, including foundry work, and will handle metals of every description. Charles H. Birmingham is manager.

New buildings which will cost about $15,000 will be erected by the Bartlett-Hayward Company, Scott and McHenry streets, Baltimore, at Turner Station, Md., to take care of a Government order.

The new tin-plate mill being erected at Sparrows Point, Md., by the Bethlehem Steel Company is expected to be in operation June 1. It will have a capacity of about 4000 tons of tin plate per month.

The Hook Foundry Company, Marcus Hook, Pa., will build a plant for the manufacture of gray iron castings. James F. Powers is manager.

The Twin City Boiler Works, Bristol, Va., has been formed with $15,000 capital stock to manufacture boilers, tanks, etc., and do repair work. W. L. Griffith is secretary of the company.

The Wiltshire Corrugated Paper Box Company, Richmond, Va., has been incorporated with $50,000 capital stock. W. B. Wiltshire is secretary.

The Standard Paper Mfg. Company, Richmond, Va., is contemplating the construction of additions to the present plant.

The Consolidated Engineering Company, 243 Calvert Building, Baltimore, has been awarded a contract for the construction of a three-story, 90 x 111 ft. purifier house for the Consolidated Gas Electric Light & Power Company.

To deal in electrical machinery, devices and equipment, the Rowan Controller Company, 308 Holliday Street, Baltimore, has been incorporated with $100,000 capital stock by Wilbur C. Jackson, John S. Rowan and Henry Vogt.

The Loane-Trask Engineering Company, builder of gas engines, 306 South Hanover Street, Baltimore, has increased its capital stock from 100 shares at par value of $2 each to 5000 shares at $10 par value each.

Cleveland

CLEVELAND, OHIO, March 12, 1917.

A heavy demand is noted for small lots of standard machine tools. No large new lists were issued the past week, although several inquiries are out for small lots. The American Steel & Wire Company is in the market for 9 small machine tools and the Buffalo & Lake Erie Traction Company, Erie, Pa., has an inquiry out for shop equipment for new car barns, which includes iron and metal-working machinery, an air compressor, and pneumatic drills. Prompt shipment can now be had on small turret lathes, but makers are several months behind in deliveries on large sizes. The demand for planing machines is active. A great deal of second-hand machinery has been thrown on the market the past two or three weeks by Ohio manufacturers who have finished munition contracts but dealers who have examined this claim that the bulk of the machines is almost worthless.

The Cleveland Brass & Copper Mills Company, Cleveland, has placed a contract with Westinghouse Church Kerr & Co., Inc., New York, for five buildings to be erected adjoining the Nickel Plate Railroad in Euclid Township, east of Cleveland, to include a casting mill, boiler house and storage buildings. The principal product will be brass sheets. Henry C. Osborne, president of the American Multigraph Company, is president of the Cleveland Company; B. F. Brewstar, formerly general manager of the Michigan Copper & Brass Company, Detroit, is vice-president and general manager, and B. M. Gardner is secretary and sales manager. Contracts for about all the equipment have been placed.

The Harris Calorific Company, 2108 Superior Viaduct, Cleveland, will shortly begin the erection of a two-story building, 70 x 125 ft., on Washington Street. It manufactures welding apparatus and laboratory equipment. J. Harris is president and general manager.

The Rex Products Company, 5606 Euclid Avenue, Cleveland, recently incorporated with a capital stock of $25,000, will engage in jobbing machine work and the manufacture of automatic screw machine products.

The Meriam Company, Cleveland, 1514 Prospect Avenue, recently organized, is engaged in the sale of gas engines, and will shortly bring out a new type of engine with special features, on which it is doing the engineering work. It will be built by the Enterprise Mfg. Company, Columbiana, Ohio.

The National Screw & Tack Company, Cleveland, will enlarge its plant by the erection of a five-story building, 55 x 140 ft. The ground floor will be used as a shipping department, and the other floors for manufacturing. New equipment, mostly screw and bolt machinery, will be required.

The Simplex Machine Company, Rockefeller Building, Cleveland, has acquired the factory of the Richmond Adding & Listing Machine Company, Richmond, Ind., and will use it for the manufacture of toolroom and bench lathes.

The Cleveland Welding & Mfg. Company, Cleveland, maker of automobile rims and truck material, will erect a one-story addition, 150 x 350 ft. Considerable machinery, mostly of a special character, will be required.

The Lakewood Engineering Company, Cleveland, will erect an addition 90 x 200 ft. for storage. The contract has been placed with the Austin Company.

The Monarch Brass Company, 4613 Payne Avenue, Cleveland, contemplates the erection of a brass foundry and factory building adjoining its present plant.

The Ohio Steel Foundry Company, Lima, Ohio, has increased its capital stock from $800,000 to $1,500,000. It is stated that plans for extensive additions and another branch plant are under way.

The Wise-McClung Mfg. Company, Canton, Ohio, has been incorporated with a capital stock of $200,000 to manufacture electric vacuum sweepers and electrical household appliances. Among the men interested are W. J. Wise, formerly connected with the Wise-Harrold Company, New Philadelphia, and William McClung.

The Searchlight Gas Company, Canton, has been taken over by the Air Reduction Company, 50 Broad Street, New York. It is stated that the capacity of the plant, which supplies gas for use in manufacturing industries, may be doubled.

The Ryder Brass Foundry Company, Bucyrus, Ohio, is contemplating the erection of additions to double its capacity.

The American Clay Machinery Company, Bucyrus, has increased its capital stock from $750,000 to $1,500,000.

It is reported that a forge shop, 200 x 500 ft., will be erected in Toledo, Ohio, for the Willys-Overland Company. Plans have been prepared by Mills, Rhines, Bellman & Nordhoff, architects.

The Ashland Products Company, Ashland, Ohio, has been incorporated with a capital stock of $100,000 by C. L. Smith,

Charles Roover and others to manufacture plumbing specialties, automobile jacks, and other devices.

The Painesville Metallic Binding Company, Painesville, Ohio, has purchased the plant of the National Motor Supply Company, Cleveland, which will be used for the manufacture of motor accessories.

It is announced that the Interstate Iron & Steel Company, Marion, Ohio, will build a 300-ft. extension to the main building and install an additional traveling crane.

Chicago

CHICAGO, ILL., March 12, 1917.

Van Schaack Brothers, 3402 Henderson Avenue, Chicago, will erect a two-story office and factory building, 21 x 27 and 32 x 52 ft., to cost $8,000.

M. Smolensky, 1708 West North Avenue, Chicago, has had plans prepared for a two-story warehouse, 36 x 100 ft., at 2501-03 North Western Avenue, at a cost of $14,000.

The Turner Mfg. Company, manufacturer of picture frames, 1444 South Sangamon Street, Chicago, is having plans prepared for a two and three-story power house and dry kiln on Ogden Avenue between Keeler and Kedvale avenues, to cost about $150,000. A. S. Alschuler, 20 East Jackson Boulevard, is the architect.

James A. Miller, 427 North Ashland Avenue, Chicago, will erect a one-story factory, 46 x 162 ft., at 552 West Adams Street, estimated to cost $40,000.

The W. F. Davis Machine Tool Company, 30 North Clinton Street, Chicago, is in the market for about 20 miscellaneous machine tools.

The H. G. Saal Company, Chicago, has purchased property adjoining its plant and has let contracts for the erection of a two-story and basement factory having about 75,000 sq. ft. of floor space, to cost about $100,000.

The Auto Stove Works, New Athens, Ill., is building an addition to its foundry and will also build an addition to its polishing and nickel-plating department.

The Harrison Machine Works, Belleville, Ill., has started work on an addition to its molding department which will enable it to increase its output.

The Harrison Steel Castings Company has let the contract for the construction of its plant at Murphysboro, Ill., to the East St. Louis Bridge Company.

The plant of Hagerty Brothers & Co., millwrights and machinists, Peoria, Ill., was destroyed by fire with an estimated loss of $50,000.

The Williams Motor Company, Waukegan, Ill., is completing plans for a factory building, work to start early in the spring.

The Elgin Gas Motor Company, Elgin, Ill., has been incorporated with a capital of $20,000 by L. B. Kilbourne, George H. Zendt and William Ehlerding.

Trachti Brothers, East Eighteenth Street and Court Avenue, Des Moines, Iowa, formerly of Racine, Wis., are establishing a shop to manufacture sheet-iron tanks and to do general sheet metal work.

The Bettendorf Company, Bettendorf, Iowa, manufacturer of car frames, steel cars, etc., has issued $1,500,000 for increased working capital, which was authorized at a meeting of the directors Feb. 26.

The Wright Carriage Body Company, Davenport, Iowa, is planning the immediate construction of a one-story brick addition to its body assembling department, to cost $7,500.

The Reynolds Machine Mfg. Company, Moline, Ill., has been purchased by interests in Massillon, and will be incorporated for $200,000. It manufactures power screw driving machines, and as soon as a suitable site can be secured, will erect a fireproof building with a floor space of 36,000 ft.

A. B. Gochenour, Sycamore, Ill., is president and general manager of the Chicago Insulated Wire & Mfg. Company, Sycamore, Ill., not H. F. Boardman, as has been stated.

The Galigher Machinery Company, Salt Lake City, Utah, will complete about April 1 the construction of a one-story warehouse, 80 x 250 ft., at a cost of about $25,000.

The H. G. Saal Company, Chicago, H. G. Saal, president, manufacturer of dies, tools, hardware specialties and other contract jobs, has purchased property adjoining its plant upon which a two-story factory will be erected at a cost of $100,000.

The William Clader Machine Works, through W. F. Conlon & Co., 803 West Madison Street, Chicago, have purchased property at Randolph Street and Willard Court, 100 x 100 ft., upon which they will erect a shop.

Milwaukee

MILWAUKEE, WIS., March 12, 1917.

Industrial activity in this district is reaching a volume of almost unprecedented proportions and the demand for machine-tools and other equipment is broadening to an unusual degree. The condition is the same throughout Wisconsin, and almost every day reports are issued concerning new metal-working projects, extensions of existing plants, and the generally urgent necessity of increasing facilities. The freight traffic situation has improved to a slight extent. Deliveries east of Chicago are still very slow and require from 20 to 30 days. It is comparatively easy to make shipments North, West and South. The labor situation is reported fair to good, and no serious trouble is anticipated around May 1, as was the case a year ago. The available supply of skilled labor is fully occupied, but unskilled men are rather easy to get at this time. When outdoor work opens in the spring a shortage of common labor is expected, due to the stoppage of immigration.

The Kempsmith Mfg. Company, Milwaukee, milling machines, has increased its capital stock from $250,000 to $300,000. Extensive plant and power equipment improvements are being completed. Paul Thomas is president and general manager.

The Stegeman Motor Car Company, Linus and Woodward streets, Milwaukee, motor trucks, is completing work on shop additions which will increase the floor space to nearly 65,000 sq. ft. Some additional equipment is being ordered from time to time. Oscar Stegeman is president and chief engineer.

The Perfex Radiator Company, Racine, Wis., automobile, truck and tractor radiators, has awarded contracts for additions which will increase the capacity about 50 per cent. E. P. Wolf is general manager.

The Racine Auto Tire Company, Racine, Wis., has engaged R. H. Folwell, architect, 332 South Michigan Avenue, Chicago, to design its proposed new plant, to cost $100,000. Details will be announced about April 1.

The Oneida Motor Truck Company, Green Bay, Wis., has leased two shops of the former American Wood Working Machine Company's plant at Webster Avenue and Willow Street, and will begin production about April 15. The shops are 48 x 140 ft., and 30 x 100 ft., and include machine-shop, smithy, assembling and wood-working facilities. G. A. Lindstrom, formerly superintendent Menominee Motor Truck Company, Menominee, Mich., has been appointed works manager and chief engineer.

The Clum Mfg. Company, 133 Michigan Street, Milwaukee, manufacturing key-operated switches and other automobile specialties, has increased its capital stock from $10,000 to $50,000. S. Deutsch is vice-president and sales manager, with headquarters in Detroit.

The Jaeschke Brothers Foundry Company, 3026 Locust Street, Milwaukee, will build a new administration building, 35 x 50 ft., two stories and basement, costing $10,000, in addition to enlarging its foundry and machine-shop.

The Nekoosa-Edwards Paper Company, Nekoosa, Wis., has awarded the general contract for the erection of a brick and steel sulphate plant to cost about $50,000.

The E. B. Hayes Machine Company, Oshkosh, Wis., has incorporated under the same style with an authorized capital stock of $175,000. It does a general foundry and machine-shop business and recently engaged in the manufacture of automobile and truck axles. J. F. Hayes is president; Edward Rhyner, vice-president, and V. R. Hayes, secretary and treasurer.

The Phelps-Hackley-Bonnell Company, Phelps, Wis., will build a new sawmill costing $50,000 to replace the plant destroyed by fire. It has purchased the sawmill machinery of the Peshtigo Lumber Company as the nucleus of the equipment of the new mill.

The Joerns Brothers Mfg. Company, Sheboygan, Wis., furniture and hardwood products, is planning to enlarge its plant at Stevens Point, Wis., to accommodate the work formerly undertaken at the main works in Sheboygan, which were destroyed by fire. The additional investment will be between $25,000 and $35,000. Roy Weiss is local manager.

The Eastern Wisconsin Electric Company, Sheboygan, Wis., is preparing specifications for a 7500-hp. turbo-generating unit for the light and power plant at Sheboygan, where $150,000 or more will be expended for improvements. The company was organized recently to take over public utilities at Fond du Lac, Oshkosh, Omro and Sheboygan, Wis.

The Racine Electric Company, Racine, Wis., suffered a loss of $25,000 by fire on March 6. Repairs are under way. The Racine Iron & Wire Works, occupying part of the same building, sustained a loss of $5,000 and was closed for a week to make repairs possible.

The Barn Equipment Company, Two Rivers, Wis., has

incorporated with a capital stock of $15,000. A plant was established several months ago and will be enlarged. Louis Sell, William Plantiko and H. Sell are the owners.

The plant of J. Thompson & Sons Mfg. Company, Beloit, Wis., plows, farm engines, etc., was damaged nearly $15,000 by fire on March 3. Rebuilding work is under way.

Stock Brothers, 228 East Main Street, Madison, Wis., have sold their machine-shop and business to E. L. Foss, who took possession March 1.

The Northern Boiler & Structural Iron Works, Mill Street, Appleton, Wis., has purchased five lots, adjoining its present shops, and will build an addition in the spring. Plans have not yet been prepared.

The Gillette Safety Tire & Rubber Company, Eau Claire, Wis., will build a one-story addition, 60 x 250 ft., as a rubber reclaiming and composition rubber goods plant, and a new stockhouse, 50 x 50 ft. R. B. Gillette is general manager.

G. W. Young, Neenah, Wis., who recently sold his interest in the Menasha Paper Company, Menasha, Wis., is contemplating the establishment of a new paper and pulp mill on the Fox River, probably at Neenah.

The George H. Harris Company, Waukesha, Wis., is contemplating the erection of a cold storage warehouse, refrigerating plant, etc., costing about $75,000.

The E. R. Wagner Mfg. Company, North Milwaukee, Wis., hardware specialties and electro-plating, is enlarging its electric motor and general equipment. The work is in charge of Thomas S. Watson Company, Milwaukee, consulting engineer.

The Burgess Battery Company, Madison, Wis., has been incorporated with a capital stock of $200,000 by members of the C. F. Burgess Laboratories, Inc., of that city, to take over its electric battery, flashlight and electro-chemical business. A new plant has been erected at 1025 East Washington Avenue, and the former plant on Pennsylvania Avenue will be occupied exclusively by the Laboratories division. The new company holds contracts with the United States Government. The officers are: President, C. F. Burgess, vice-president and sales manager, Duncan Keith; treasurer, W. B. Schulte; secretary and manager, Benjamin S. Reynolds.

Indianapolis

INDIANAPOLIS, IND., March 12, 1917.

The Laycock-Brosnan Mfg. Company, Indianapolis, has been incorporated with $40,000 capital stock to manufacture bicycles, bedsprings, etc. The directors are Thomas B. and Read B. Laycock and Daniel B. Brosnan.

The Indianapolis Castings Company, Indianapolis, has been incorporated with $175,000 capital stock to manufacture castings. The directors are Frank W. Lewis, John Wallace and Charles O. Roemler.

The Pierce Governor Company, Anderson, Ind., has increased its capital stock from $100,000 to $125,000.

The C. F. Cain Power & Light Company, Ontario, Ind., has been incorporated with $75,000 capital stock. The directors are Arthur L., Albert B., W. H., Harry F. and John C. Cain.

The George E. Homsher & Son Company, Indianapolis, has been incorporated with $10,000 capital stock to manufacture pumps, windmills, etc. The directors are George E., F. H. and O. B. Homsher.

Fire March 5 destroyed the plant of the Henri Clauss Mfg. Company, Tipton, Ind., manufacturer of cutlery, causing a reported loss of $100,000.

The main factory building of the Canton Glass Company, Marion, Ind., was destroyed by fire March 4 with an estimated loss of $80,000. Leo Nussbaum is president.

The assembling building of the Studebaker Corporation, South Bend, Ind., was recently damaged by fire with a loss reported at $30,000.

The Security Automobile Lock Company, Indianapolis, has been incorporated with $75,000 capital stock to manufacture automobile accessories. The directors are Robert T. Benefield, Andrew J. Cochran and E. E. Heller.

The Modern Refrigerator Company, Peru, Ind., will make additions to its plant to accommodate its growing business. An order from the Government for refrigerators for the Panama Canal Zone was recently booked.

The plant of the Whiteley Malleable Castings Company, Muncie, Ind., burned last fall, will be rebuilt at a cost of $300,000. About 400 men were employed.

The Southern Indiana Clay Products Company, Huntingburg, Ind., has been incorporated with $600,000 capital stock and will build a plant at Dale, Ind. The directors are Fred B. Adams, Daniel Reutepohler and C. Mandel Dowell.

The Shimer Mfg. Company, Anderson, Ind., has been incorporated with $10,000 capital stock to manufacture manifolds and carbureters. The directors are Frank L. Tracy, Allen C. Shimer, Frederick T. Barber, Glen W. Gates and Elmer S. Albright.

The Valentine-Glascock Company, Muncie, Ind., has been incorporated with $50,000 capital stock to manufacture toys. The directors are John Valentine, William P. Murray and Henry C. Gordon.

Arbuckle & Co., manufacturers of tile and brick machinery, Rushville, Ind., will soon reopen their foundry. John Kinsley, Muncie, will be foreman.

The Central Metallic Door Company has completed plans for its new plant at Gary, Ind., and will start construction work at once.

The Link-Belt Company, Indianapolis, will add a new foundry building to cost $30,000.

The Superb Mfg. Company, Remington, Ind., manufacturer of automobile shock absorbers, is making arrangements to move to Monticello, where it will erect a new factory.

The item in THE IRON AGE of Feb. 15 reporting the Automobile Dump Car Company's incorporation at South Bend, Ind., was incorrect. The name of the company is the Automatic Dump Car Company, South Bend, Ind., incorporated with a capital stock of $100,000, not $25,000, to manufacture automatic dump cars for railroads. P. C. Fergus, attorney, 409 Union Trust Building, South Bend, is a director.

Detroit

DETROIT, MICH., March 12, 1917.

Each week registers an increasing demand for small lots of machine tools with the total volume unusually strong. Inquiries from large manufacturers indicate that the first of April will see the placing of large orders. General manufacturing conditions are good, the shortage of cars being the only handicap. Automobile companies are meeting this by driving new cars as far West as Denver and as far East as Pittsburgh, one manufacturer sending out fleets of 100 daily. Labor conditions are excellent. Deliveries on lathes are better. Grinding and milling machines are promised for between July and September.

The Wilson Body Company, Detroit, has purchased the Hargreaves plant in this city and is making extensive alterations and additions for the manufacture of closed automobile bodies exclusively. Special machinery will be installed and operations will begin in 60 days.

The Snyder-Barr Screw Company, Detroit, has organized to manufacture screw machine products. It has taken over the Farrand Power Building at Twelfth Street and the Grand Trunk Railroad, where operations will begin April 1. The officers are H. W. Stuart, Sarnia, Ont., president; H. H. Gildersleeve, Sarnia, vice-president; M. L. Snyder, Detroit, secretary and treasurer; C. E. Barr, Detroit, superintendent of production.

The Biggam Trailer Corporation, Detroit, manufacturer of automobile trailers, has completed additions to the plant formerly occupied by the Detroit Axle Company, 231-235 Sixteenth Street, and has orders on hand to keep it running to capacity for six months. H. T. Biggam is president.

The Steel Treating Equipment Company, Detroit, has purchased one and three-quarters acres of land on the Michigan Central Railroad and Lafayette Avenue and is contemplating the erection of a new building.

It is reported that the Federal Motor Truck Company, Detroit, has purchased 34 acres of land in Springwells, just outside of Detroit. While the report cannot be confirmed it is stated authoritatively that the Federal Motor Truck Company will construct a new factory in the immediate future.

The Detroit Steel Products Company, with offices at 2250 East Grand Boulevard, Detroit, is increasing its equipment in anticipation of new business. Sales the past month were 100 per cent greater than for the same month last year. The company makes self-lubricating springs for motor cars and trucks and solid steel windows for factory buildings.

The Kesslar Motor Company, Denver, Col., and Detroit, has been incorporated in Michigan with a capital stock of $500,000.

The Michigan Tire Company, Grand Rapids, Mich., is planning to construct a three-story brick building.

The Auto Hearse Remodeling Company, Grand Rapids, Mich., has been incorporated and will rebuild horse-drawn vehicles, hearses, ambulances and automobiles. The stockholders are Charles E. Downey, Daniel C. Lyzen and Victor U. Heather.

The Briscoe Corporation, Jackson, Mich., has begun work on an addition to its plant, 135 x 344 ft. The entire plant will be used to manufacture the Redden truck-maker, a one-ton truck attachment.

A company to manufacture ice skates, etc., for winter sports is announced for Detroit with a capital of $100,000. Those interested are A. E. Sheill of the Witchell-Sheill Company, Detroit; R. C. McGuire, New York, and George C. Miller, Rochester, N. Y.

The Barley Motor Car Company, formerly of Streator, Ill., has begun the removal of its plant to Kalamazoo, Mich., where accommodations have been leased in the plant of the defunct Michigan Buggy Company.

The Campbell, Wyant & Cannon Foundry, Muskegon Heights, Mich., which was damaged $30,000 by fire last week, will begin at once the construction of a brick and concrete building to replace the frame structure formerly used as a core room.

The Heyman Package Company, Grand Haven, Mich., has secured the plant of the Grand Haven Basket Company and will manufacture baskets, crates and knockdown boxes. H. C. Link, Memphis, Tenn., will be manager.

The Eureka Vacuum Cleaner Company has increased its capital stock from $25,000 to $100,000 to enlarge its output.

The Industrial Foundry Company, St. John's, Mich., John Spausta, proprietor, is building an addition, 40 x 150 ft. It manufactures gray iron castings, specializing in gasoline engine parts.

Cincinnati

CINCINNATI, OHIO, March 12, 1917.

Foreign contracts for war munitions, on which many manufacturers in the Miami River Valley district have been busy for some time, are now expiring. It is stated on good authority that these are not being renewed. As a consequence activity in these plants shows a slackening, with many skilled and unskilled workmen being laid off. As far as the machine-tool industry is concerned every plant is busy, and a great deal of domestic business is in sight that will develop into orders at an early date. Shipbuilding firms, steel mills and automobile manufacturers are good customers, and the railroads are also quietly placing orders for single tools. A nearby concern has commenced work on a 42-ft. boring and turning mill for the Government, which is said to be one of the largest machines of its kind ever built in this country.

The demand for internal combustion engines is rapidly increasing and manufacturers in central Ohio, who make a specialty of these were never busier. On account of the recent natural-gas shortage, due to the cold weather, several large firms are contemplating installing producer gas plants. Small electric motors are being sold in larger numbers than at any previous time.

It is reported, but not officially confirmed, that the Sayers & Scoville Company, Cincinnati, maker of automobile bodies and other specialties, is having plans prepared for an addition to its plant that will more than double its present capacity.

The Marietta Chair Company, Cincinnati, has leased a building near its present plant that will give it nearly 50,000 sq. ft. additional floor space. The new addition will be used almost exclusively for storage purposes, and very little machinery equipment will be required.

The United States Cast Iron Pipe & Foundry Company, Addyston, Ohio, has plans under way for additions to its plant to cost $300,000. Part of this sum will be spent in extending the machine shop.

The Edna Brass Works, Cincinnati, will make an addition to its plant on Reading Road at an early date. The company manufactures engine-room specialties.

Estimates are being received by Ward Baldwin, Cincinnati, for a power plant addition to the plant of the Union Distilling Company.

The Norwood Sash & Door Company, Norwood-Cincinnati, has had plans prepared for an addition to its plant, 40 x 200 ft., one story, of mill construction.

Work has been commenced on the foundations for the new plant of the Champion Tool Works Company, Cincinnati, recently mentioned. The proposed building will be one story, 154 x 300 ft., and will be sufficiently large to enable the company to double its present output of lathes.

The Weeks Company, Hamilton, Ohio, has been incorporated with $25,000 capital stock by Harry G. Weeks and others. The company manufactures small electrical household specialties and has heretofore been operated under a partnership arrangement. New factory quarters have been secured on South Seventh Street and it is arranging to greatly increase its present output of heaters and other appliances.

The Bonney-Floyd Company, Columbus, Ohio, suffered a fire loss last week estimated at $15,000. The power plant was badly damaged, but the plant is expected to be in full operation before the end of this week. The company makes a specialty of steel castings.

The Jeffrey Mfg. Company, Columbus, Ohio, intends to install a gas producer plant in order to take care of the needs of its plant independently of the natural-gas supply.

The Municipal Machine Company, Piqua, Ohio, has increased its capital stock from $25,000 to $350,000, and will establish a factory for the manufacture of a street-sweeping machine.

The Miami Trailer Company, Troy, Ohio, maker of automobile and auto-truck trailers, will make an addition to its plant. Details are lacking as to the size of the building.

The Central South

LOUISVILLE, KY., March 12, 1917.

Business is active, with inquiries numerous, especially for electric motors and equipment for coal mining and oil-producing operations. One local boiler manufacturer states he has never seen such a large demand as is evident at present. Gasoline and oil engine distributors are finding a good call for their product. Local architects' offices are reported full of work which is held up to a considerable extent by inability to obtain structural steel. A local vehicle manufacturer reports that his business has shown an increase over last year to date of more than 100 per cent. The coal supply situation is easing up, although shortage of coal mine labor is tending to limit production.

The Universal Motor Equipment Company, Louisville, Ky., has been incorporated with capitalization of $5,000 by Jack F. Marx, George Haller and J. B. Kennedy, Jr.

Fire on March 6 damaged the machinery of the Cotton Seed Products Company, Louisville, Ky., to the extent of $10,000. E. L. Goss is general manager.

The Oklahoma-Kentucky Oil Company, Irvine, Ky., has been incorporated with capital stock of $3,000,000 by L. V. Mullen and J. S. Mullen, Ardmore, Okla., George B. Williams, Irvine, and others, and will erect a refinery.

The Chattanooga Stamping & Enameling Company, Chattanooga, Tenn., will add two additional furnaces to its plant in North Chattanooga. It now has three.

The E. M. Gant Mfg. Company, Lawrenceburg, Tenn., has been incorporated with capital of $5,000 by E. M. Gant, Alf H. Williams, I. M. Bryan and others, to make a rope meter and other products.

John R. McWane, Lynchburg, Va., and others, are organizing the McWane-Tennessee Cast Iron Pipe Company, to be capitalized at $100,000 and to build a foundry at Rockwood, Tenn., to make cast-iron pipe. J. M. Baker, Harriman, Tenn., and F. W. Climer and Polk Tarwalker, Rockwood, are interested.

The Artificial Stone & Tiling Company, Knoxville, Tenn., has incorporated with $20,000 capital and will equip a plant. R. A. Mouron, T. S. Webb, Jr., C. H. Harvey, Ben McMurray and others are incorporators.

A. J. Robinson, Centerville, Tenn., is in the market for a 35 or 40-hp. high pressure boiler and engine on wheels, second hand preferred and is asking prices on tight barrel machinery.

Fire on March 9 destroyed the plant of the Durex Chemical Company, Sweetwater, Tenn., with a loss of $75,000. Contracts for additions to the plant costing $150,000 had been let and the new work will be pushed.

The Columbia Produce Company, Columbia, Tenn., is in the market for a refrigerating machine of 12½ tons capacity, and piping for coolers.

The Banks-Mitchell Company, Chattanooga, Tenn., has been incorporated by L. A. Banks, Lon W. Mitchell and others with a capital stock of $5,000 to make fire brick.

The John J. Duncan Company, Knoxville, Tenn., wants dealers' price on a 14-in. to 16-in. power shear, for quick delivery.

Birmingham

BIRMINGHAM, ALA., March 12, 1917.

Mining and coking machinery and apparatus are in great demand. Wholesale machinery dealers report a general activity in practically all lines.

The Georgia Southern Utilities Company, Atlanta, Ga., will issue $15,000 of additional capital and $1,000,000 first mortgage bonds, of which $65,000 is to go into plant improvement.

J. Ed. Foy and Dermot Shemwell, Lexington, N. C., have organized a company with $100,000 capital to further develop water power near Columbia and to furnish electricity to Columbia, Headland and Ashford.

The Southern Power Company, Charlotte, N. C., will build a

hydroelectric plant on Wateree River at cost of $5,000,000 to generate 100,000 hp. It has let construction contract valued at $2,000,000 to the Hardaway Contracting Company, Columbus, Ga. The Allis-Chalmers Mfg. Company, Milwaukee, has been awarded the contract for water wheels and generators.

The Kin Cooperage Company, Pekin, Ill., will build a plant near Mobile to manufacture staves, headings and barrels.

St. Louis

ST. LOUIS, MO., March 12, 1917.

Local deliveries have been benefited as a result of delayed exportations. Transactions continue heavy and up to the capacity of dealers to provide satisfactory deliveries, the equipment wanted covering all industries. No large lists are out as the practice continues of handling equipment needs by individual negotiation for specific tools.

The Stillwagon Mfg. Company, St. Louis, has been incorporated with a capital stock of $50,000 by Harry Handschlegel, J. J. McMullen and A. I. Jacobs to manufacture feeds, installing grinding equipment.

The Demountable Spring Tire Company, St. Louis, has been incorporated with a capital stock of $50,000 by N. W. McLeod, Howard V. Stephens and E. C. Krausnick and others to manufacture tire specialties and devices.

The Diamond Carbon Remover Company, St. Louis, has been incorporated with a capital stock of $50,000 by Alfred H. Poe, James S. Tillmann and others to manufacture carbon-removing compounds and automobile accessories.

The Federal Light & Traction Company, Springfield, Mo., will build an additional electric plant to cost about $250,000. Sanderson & Porter, 52 William Street, New York, are the engineers in charge.

The M. O. K. Electric Company, Kansas City, Mo., has been incorporated with a capital stock of $16,000 by Paul M. Fogel, Harry F. Fisher and G. W. Stubbs to manufacture electrical equipment.

The Truman Ice Company, Truman, Ark., John and J. F. Mason and others interested, is in the market for about $4,000 worth of ice-making machinery.

The Fort Smith Metal Products Company, Fort Smith, Ark., has been incorporated with a capital stock of $50,000 by S. B. Nussbaum, Ed Ballam and W. J. Kropp to manufacture metal products.

The Mid-Co Gasoline Company, Bartlesville, Okla., will equip a plant for furnishing electric light, power and heat to nearby sections.

Billings, Okla., will expend about $50,000 on waterworks and electric light and power plants, under the direction of the Walton Engineering Company, State National Bank Building, Oklahoma City, Okla.

Frederick, Okla., will expend about $100,000 on electric light, power and waterworks plants.

The Central Oklahoma Light & Power Company, Oklahoma City, Okla., has been incorporated with a capital stock of $100,000 by George M. Green, H. L. McCracken and L. Smilie to equip public service plants in Oklahoma.

Sallisaw, Okla., will install one 500-kw. generating unit and boilers in its electric light plant. George E. McCants is general manager.

The Consumers' Light & Power Company, Ringling, Okla., has been organized with a capital stock of $1,000,000 by William H. Baehr of Chicago and others and will acquire gas, ice and electric plants in the vicinity.

Enid, Okla., will equip a waterworks plant to cost about $50,000, under the direction of F. W. Brooks, superintendent.

The Columbus Railway, Light & Power Company, Columbus, Miss., will install one 1000-hp. steam turbine which will double the capacity of its plant.

The Price Veneer Company, Columbia, Miss., will equip a veneer plant requiring about $13,500 of machinery, including one 300-hp. boiler, veneer lathes, resaws, etc. F. V. B. and Virgil F. Price are active in the company.

S. T. Alcus & Co., Hagen Avenue and New Basin, New Orleans, La., will equip a veneer and box-making plant at Slidell, La. About $14,000 worth of machinery will be bought.

De Ridder, La., will receive bids for a waterworks plant of 1,000,000 gal. capacity, including oil engines, deep well pumps, etc. C. C. Davis, mayor, has the plans.

The Henderson Oil Mill Company, Shreveport, La., has been organized with a capital stock of $400,000 by R. W. Henderson, Talladega, Ala.; M. C. Stockbridge, Ruston, La., general manager, and others, and will consolidate a number of cotton oil, fertilizer and cake plants, increasing the equipment and installing new machinery. A cottonseed oil mill of 12 presses will also be equipped at Shreveport, La.

Texas

AUSTIN, TEX., March 10, 1917.

The machinery trade shows little change since last week. Considerable mining machinery has recently been shipped into Mexico from San Antonio and other border points.

It is reported that the Missouri, Kansas & Texas Railroad will construct new shops at Smithville.

The shops of the National Railways of Mexico at Nuevo Laredo are being moved to Saltillo, 225 miles south of Nuevo Laredo.

Clarence R. Miller and Burnie Miller, Dallas, and associates, are having plans drawn for a reinforced concrete cotton mill at a cost of about $500,000.

It is authoritatively announced that W. T. Sinclair of New York, and associates, will build an oil refinery at Houston to cost about $2,000,000. The plans involve the laying of an 8-in. oil pipe line from the Oklahoma oil fields to Houston at an estimated cost of $6,000,000.

The Texas Power & Light Company, Dallas, will rebuild the electric power and light plant at Dublin, which it recently purchased.

California

LOS ANGELES, CAL., March 12, 1917.

The California Mechanical Development Company, Los Angeles, manufacturer of special equipment for lathes and automobile work, has leased property at 414-18 East Ninth Street for a new manufacturing plant. Equipment will be installed for machine and tool work.

The Porcelain Products Company, Los Angeles, Cal., recently incorporated at Dover, Del., has purchased 10 acres at Torrance and plans the erection of a plant for the manufacture of sanitary earthenware. The furnace buildings will be 200 x 300 ft. It is planned to have the plant in operation in about six months. Dr. S. Trood, Finkle Arms Apartments, 912 Figueroa Street, is active in the company.

The Union Oil Company, Los Angeles, has acquired about 250 acres at San Pedro harbor, and plans the erection of a refining plant.

The Acme Signal Company, Los Angeles, has been incorporated with a capital of $50,000 to manufacture traffic signals. Frank J. Husbands, S. J. Vellex and Carl Hofman are the incorporators.

The Sunset Carbon Company, Whittier, Cal., recently incorporated with a capital of $75,000, has acquired 2 acres at Hadley and Magnolia avenues for a plant for the manufacture of carbon for electrical use. Edward Gray is president.

The Santiago Orange Growers' Association, Orange, Cal., has authorized the preparation of plans for an ice-manufacturing and pre-cooling plant, estimated to cost $50,000.

The Hotpoint Electric Company, Main Street and Lemon Avenue, Ontario, Cal., manufacturer of electric appliances for heating and cooking, will build a one-story addition to its plant, 45 x 60 ft.

The Ulmer Machinery Company, Portersville, Cal., has arranged for the erection of a brick and concrete building, 30 x 50 ft.

George W. Bush, Marsh-Strong Building, Los Angeles, has made application to the City Council, San Diego, for a lease of property at the foot of Crosby Street for the erection of a shipbuilding and repair plant.

The plant of the Shaw Batcher Pipe Works, near Brighton, Cal., was recently destroyed by fire with loss estimated at $75,000.

The Pacific Northwest

PORTLAND, ORE., March 6, 1917.

The growing demand for wooden ships is reflected in the demand for wood-working tools and machinery from the Oregon and Washington shipyards. Machine shops throughout the Northwest, urged by the increasing demand for ship machinery, are extending their plants to provide for the manufacture of small auxiliary equipment. Many of these plants are running night and day shifts, and yet are behind in their orders. The car shortage, while less severe at some points, shows no improvement at others. This is retarding lumber development; and, unless there is an early improvement will begin to be felt by the machinery houses. At present the business with the sawmills is fully up to the average. The demand from garages and small machine shops throughout the Pacific Northwest is good. A number of new automobile repair shops are also in the market for equipment.

Recent figures show that Seattle shipbuilding plants now have under construction, or under contract, steel and wooden warships and commercial vessels at prices amounting to $64,000,000. This work includes 43 steel steamships, besides a large number of wooden hull merchant ships and unusual number of cannery tenders, fishing vessels and smaller craft. Since the middle of February Seattle plants have signed contracts to build 15 large vessels. The Ames Shipbuilding Company recently received orders to build seven steel vessels for the Cunard line and two other steamships to cost $11,000,000. The Skinner & Eddy Shipbuilding Corporation recently signed a contract to construct a 9500-ton oil tanker for Eastern interests. Within the past two weeks several plants have refused contracts, and the local concerns are in many instances able to pick and choose. The only problem before the shipbuilders now is the car shortage, which is causing a scarcity of materials and in some instances crippling the work of the larger plants. A general advance in the price of lumber throughout the Northwest has taken place within the last few days.

The Pacific Steel & Boiler Company, Tacoma, Wash., A. J. Ritchie, manager, plans the construction of a one-story addition, 50 x 220 ft., to its plant, and has been buying new machinery required for its operation.

The Sound Paper Company, Seattle, has been incorporated for $5,000,000 by H. O. Pond, S. P. Weston, Scott Calhoun, Joseph Parkin and John A. Homer. It is understood the company plans the construction of a manufacturing plant.

The E. K. Wood Mills, Bellingham, Wash., plans the construction of a second lumber carrier, equipped with semi-Diesel engines, to cost $150,000, and have capacity of 750,000 ft. of lumber.

The Burpee & Letson Company, machinery manufacturer, Bellingham, recently shipped canning machinery valued at $10,000 to Vladivostock, to be used in new Siberian salmon canneries.

R. F. Guerin, of the Standard Construction Company, Seattle, and L. H. Gray of L. H. Gray & Co., Seattle, have taken over a site on the Seattle waterfront, on which it is planned to construct a wooden shipbuilding plant.

The Coast Shipbuilding Company, Portland, Ore., has been organized with a capital stock of $400,000 by James B. Kerr, A. L. Mills, Donald W. Green and Charles E. McCulloch. The company plans the immediate establishment of a plant to build wooden vessels.

George W. Moore, Bandon, Ore., is at the head of a group of capitalists who plan the erection of a shipbuilding plant in Bandon. The local men will furnish a portion of the $75,000 required, the balance to be supplied by a Portland syndicate.

The Hesse Martin Iron Works, Portland, Ore., is now manufacturing auxiliary ship machinery. Contracts have been closed for 18 heavy anchor windlasses, 20 cargo winches, 5 steam capstans and 13 complete steering gears. Besides this equipment it is also turning out traveling cranes and a pneumatic bolt header.

The Coast Shipbuilding Company, Portland, has been incorporated with a capital stock of $400,000 by A. M. Sherwood, D. W. Green, C. E. McCulloch, J. B. Kerr and A. L. Mills. The company will manufacture wooden ships.

The Skinner & Eddy Corporation, shipbuilder, Seattle, has secured an option on 15 acres of waterfront property adjoining their plant.

The Pacific Auto Accessory Company, Portland, has been incorporated with a capital stock of $50,000 by W. R. Lovegren, F. B. Ruthland and H. M. Lovegren.

The Clatsop Mill Company, Astoria, Ore., whose box factory, boiler rooms and kilns were burned with a loss of $180,000 early in February, is to rebuild.

Specifications have been received at Bremerton, Wash., for a power plant to cost $30,000.

Supple, Ballin & Lockwood, Portland, shipbuilders, will equip a yard on the east side of the Willamette River. The new firm reports contracts for two 4000-ton steel-reinforced wooden motorships.

On June 4 Portland will vote on a proposition of issuing $1,777,000 in bonds for the erection of a municipal lighting and power plant.

F. C. Knapp, president of the Peninsula Shipbuilding Company, announces that plans are being made for the enlargement and rebuilding of its plant.

The Howe Self-Registering Valve Company, Silverton, Ore., has been incorporated by G. A. Howe, C. A. Hartley and C. J. Cooley with a capital stock of $10,000.

The Chelsea Lumber & Box Company, Klamath Falls, Ore., recently incorporated, has secured a site and will erect a sawmill and box factory with a capacity of 45,000 ft. per day at a cost of $50,000.

Canada

TORONTO, ONT., March 12, 1917.

While the machine-tool market is not particularly active business is a little better than it was earlier in the year. Canadian tool builders have, however, plenty of work on hand. Deliveries are if anything rather slow. Prices are very firm and further advances on some lines are expected. Quotations on all scrap metals are firm with an upward trend. The ingot metal market continues firm.

Activity in shipyards in Canada is very great. Reports received at Ottawa indicate that more than 100 vessels ranging in size from 250 to 6000 tons displacement are now under construction in the Dominion. Sailing vessels are in the majority and most of them are being built on the coast of western Nova Scotia. Indeed it is stated that many yards in the Maritime Provinces, idle since steam replaced sail, have now ships on the stocks. The yards of the Polson Iron Works and the Thor Iron Works at Toronto are constructing steam vessels. There is also great activity at Port Arthur and on the Pacific coast, where a large number of ocean going steamships are being built for Norwegian interests.

The ratepayers of Preston, Ont., have carried a by-law to guarantee the bonds of the Preston Car & Coach Company to the amount of $75,000. The company will erect a new plant at Preston to replace the one recently destroyed by fire.

The terminal elevator of the Northern Elevator Company at Winnipeg, Man., was totally destroyed by fire March 9 with a loss of $150,000.

Smith & Sons, Brigden, Ont., are in the market for a woodworking machine and lathe.

The Montreal Locomotive Company, Montreal, which has been practically wholly engaged in the manufacture of munitions, has decided to extend its plant. Building permits have been taken out for four additions to cost $6,000.

The contract has been let for a plant for the Stowel Screw Company, 70 St. Ambrois Street, Montreal, at Longueil, Que., to cost $13,000.

The scavengering department, Edmonton, Alberta, will shortly be in the market for an air compressor.

W. L. Miller & Co., 44 St. George Street, Montreal, are in the market for engines, boilers, motors, sawmill and planing-mill machinery, machine-shop and railroad equipment.

Aurora, Ont., plans a sewage system, including a low-level pumping plant and disposal works to cost $87,600. James Louden & Hertzberg, Excelsior Life Building, Toronto, are the engineers.

The Canadian Linderman Company, Ltd., Woodstock, Ont., is in the market for a 20 to 40-hp. alternating current 220-volt 25-cycle three-phase motor.

The car barn of the Nipissing Central Railway, North Cobalt, Ont., was partly destroyed by fire March 4. The damage to the building will amount to $40,000 and to the cars $60,000. The loss to electrical equipment will be $30,000.

The Chapman Engine Company, Dundas, Ont., will commence the erection of a plant to replace that recently destroyed by fire with a loss of $50,000.

S. Marks, Nipigon, Ont., is making preparations for the erection of pulp and paper mills there to cost $1,000,000.

The Kingsdale Box Company, Ltd., Kingsdale, Ont., has been incorporated with a capital stock of $60,000 by William P. Gillespie, 110 McKinnon Building, Toronto; Benjamin Ross, Newmarket, Ont.; Joseph H. Noble, Aurora, Ont., and others.

The Shell-Bar, Boico Supply, Ltd., Toronto, has been formed with a capital stock of $40,000 by Henry D. Lanz, 42 Tyndall Avenue; George S. Moffat, Jacob L. Wilson and others to manufacture munitions, etc.

The Gillespie Elevator Company, Edmonton, Alberta, proposes to erect four or five elevators this summer of about 30,000 bu. each.

The Northern Grain Company, Gariepy Block, Edmonton, Alberta, is preparing plans for four elevators of 40,000 bu. each.

The Riordon Pulp & Paper Company, Ltd., 1 Beaver Hall Square, Montreal, will erect a sulphite plant at Haileybury, Ont., to have a daily capacity of 500 tons. E. Inwood is purchasing agent.

The Carbon & Alloy Company, Ltd., Hamilton, Ont., will shortly call for tenders for buildings to cost $100,000, and will be in the market for furnaces, compressors, cranes, conveyors, and other equipment to cost $200,000.

The Canadian Engineering & Contracting Company has been awarded the contract for the erection of an addition to the plant of the Dominion Steel Foundry Company, Depew Street, Hamilton, Ont., to be of corrugated iron and concrete construction, one-story, to cost $27,000.

J. J. Harty, general manager of the Canadian Locomotive Works, Kingston, Ont., announced that his company had closed a contract with the Grand Trunk Railway Company for 10 large Mikado type locomotives. These engines, together with the ones being constructed for the Canadian Government Railways, the British War Office and the Toronto, Hamilton & Buffalo Railway, and additional shell orders taken within the past few weeks, insure capacity operations for the works for some time.

The International Shipbuilding Corporation, Ltd., Montreal, has been incorporated with a capital stock of $2,000,000 by Henry A. Lovett, George W. Cole, Norman Sheach and others.

The Canadian Coal Products Engineering, Ltd., Toronto, has been incorporated with a capital stock of $1,000,000 by Archibald J. Reid, 96 Dewson Street; George N. Limpricht, 28 Herbert Avenue; William Bowler and others.

The Standard High Speed Steel Hardening Company, Ltd., Montreal, has been incorporated with a capital stock of $150,000 by Anthime Fortin, Frank Willdon, Francois Guerin and others.

The Canadian Rein Drive Tractors, Ltd., Toronto, has been incorporated with a capital stock of $1,000,000 by Henry J. Martin, 46 Elm Avenue; Charles Evans-Lewis, 6 Adelaide Street East; Thomas N. Poole, 35 Vermont Avenue and others.

Construction work has just been started on a power plant at Hangingstone Falls, Ont., for the South Bay Mines Company, under the supervision of Lynn Adsit, mining engineer. The plant will have a capacity of between 1500 and 2000 hp. It is expected that the first unit with a capacity of 300 or 400 hp., will be ready by next September. Sutcliffe & Neelands, Haileybury, Ont., are in charge.

Bids are now being received for the construction of an addition to be one story, 216 ft. long, to the plant of the International Malleable Iron Company, Guelph, Ont.

The Union Special Machine Company of Canada, Ltd., has been granted permission to manufacture machinery in Ontario, with a capital stock of $25,000 and has appointed James S. Lovell, 25 King Street West, Toronto, its attorney.

Mr. Hall, 33 Stirton Street, Hamilton, Ont., is in the market for the following equipment: One 24-in. or 26-in. x 12 or 14 ft. x 36-in. gap lathe; one 20-in. back-geared self feed drill; one 2-ton chain block; one 1-ton chain block; one 1000-lb. platform scale; one ⅝-in. and under tapping attachment for drill press.

The planing mill owned by Wilson Brothers, Ltd., Collingwood, Ont., was destroyed by fire March 6 with a total loss of $100,000.

Government Purchases

WASHINGTON, D. C., March 12, 1917.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until March 27, schedule 807, for one locomotive crane for Portsmouth; until date not set, schedule 817, for one air compressor and schedule 819 for miscellaneous air, main feed, fuel oil and other pumps, all for Puget Sound.

Bids were received by the Bureau of Supplies and Accounts, Navy Department, Washington, March 6, for supplies for the naval service as follows:

Schedule 682, Steam Engineering

Class 1, Mare Island—Two engine lathes. Bid 12, $1,044; 36, $1,360 and $1,405; 40, $1,020; 47, $1,722, $1,619, $1,712, $1,210, and $1,112; 58, $1,151; 62, $900.

Class 2, Mare Island—Two emery grinders—Bid 13, $199; 18, $225; 36, $186.

Schedule 683, Steam Engineering

Class 5, one vertical surface grinding machine—Bid 47, $3,365; 52, $2,800; 55, $2,262.

Class 6, Mare Island—Air-compressor plants—Bid 12, $717.40; 77, $717.40.

The names of the bidders and the numbers under which they are designated in the above list are as follows:

Bid 12, Carroll Electric Company; 13, Cincinnati Electrical Tool Company; 18, James Clark Electric Company; 36, Kemp Machinery Company; 40, Master Machine Works; 47, Manning, Maxwell & Moore; 52, Pratt & Whitney Company; 55, Pacific Tool & Supply Company; 58, Harron, Rickard & McCone; 62, F. O. Stallman Supply Company; 77, Westinghouse Traction Brake Company.

The Chief of the Bureau of Yards and Docks, Navy Department, Washington, will receive sealed proposals until 11 a. m. April 2, for furnishing one 150-ton, two 15-ton, one 20-ton and one 5-ton electric traveling bridge cranes for the Navy Yard at Philadelphia; until 11 a. m. April 9, for two motor-driven locomotive jib cranes of 50 gross tons capacity, for Norfolk and Philadelphia.

NEW TRADE PUBLICATIONS

Evaporators and Feed Water Heaters.—Row & Davis, 90 West Street, New York City. Two bulletins. The first, No. 51, illustrates and describes an evaporator for single or multiple effect operation, special emphasis being laid upon the patented new type of manifold which is mounted on a hinged door to facilitate inspection, cleaning, etc. The other bulletin, No. 52, describes in considerable detail a feed water heater containing a group of helical coils arranged in parallel between the inlet and outlet headers through which the water passes. The fact that the water to be heated does not come in contact with the steam and is not contaminated by oil or other impurities that may float into the heater is emphasized, and the construction of the various parts is gone into at some length. Halftone engravings and line drawings supplement the text matter of both bulletins.

Tool Steels.—Braeburn Steel Company, Braeburn, Pa. Booklet. Gives a complete list of the tool steels made by this company, with reproductions of the labels and full information on the special purposes for which each brand is particularly adapted. Mention is made of the facilities which the company has for producing steel forgings and various grades and percentages of nickel, chrome-nickel, chrome-vanadium, tungsten and special analysis steels. Tables of the various cutting extras and weights of cast steel are given. Instructions for working the tool steels are included.

Rolling Mill Equipment.—United Engineering & Foundry Company, Pittsburgh. Booklet. Describes some of the large rail mill and steel works equipment built by this company. Views are presented of large installations of iron and steel works equipment, including the rail mills of the Inland and Bethlehem Steel companies. Engravings are included of plate, universal, bar and tube mills, including a 30-in. bar mill in the plant of the West Penn Steel Company, which reduces a 12-in. ingot to a sheet bar in 14 passes and has a capacity of about 1000 tons per month, and the tube mill equipment of the Republic Iron & Steel Company.

Deoxidizing Agent.—S. Obermayer Company, 2835 Smallman Street, Pittsburgh. Circular. Mentions the use of the Rilliton brass cleaner, which it is emphasized is not a flux, but a deoxidizing agent. The product is designed for use in ladles, crucibles and furnaces to reduce the oxides to metals. Directions for using the cleaner in flame type furnaces and crucibles are presented.

Vibrator for Molds.—E. J. Woodison Company, Detroit. Circular. Presents illustrations and a brief description of a vibrator designed for attachment to pattern plates, molders' tubs and benches for molding machines. The device, which is designed as a substitute for hand rapping, is connected to the lighting socket of an alternating-current system, and the operation is controlled by a knee switch. A table of the specifications of the various sizes of vibrator made is included. An illustrated description of the device appeared in THE IRON AGE, Sept. 7, 1916.

Steam Boilers.—International Boiler Works Company, East Stroudsburg, Pa. Cardboard multiplication table for products ranging from 1 x 2 to 50 x 132. The device consists of a circular disk with a number of radial columns of figures giving the products for the numbers on the circumference of the disk when multiplied by those on the movable arm, which run from 1 up to 50. In use the arm is brought to the left of one of the numbers on the circumference of the disk, and the product is found in the column opposite the other number on the arm. Mention is made of the facilities which the company has for executing special plate, metal and boiler work, in addition to a standard line of steam boilers for both stationary and marine use.

Spot Welding Machines.—Thomson Spot Welder Company, Cincinnati, Ohio. Five bulletins, Nos. 201 to 205 inclusive. Cover a line of machines for spot welding sheet steel where the total thicknesses of the metals vary from ⅛ to ⅝ in. Each of the bulletins is practically the same in arrangement, engravings of the different machines of the particular type described being presented, with general description and specifications and views of the machines in use.

Tool Steels.—Vanadium-Alloys Steel Company, Pittsburgh. Folder. Contains brief descriptions of three brands of carbon tool steel, with data on the uses to which they may be put and the shapes in which they are supplied. Rules for hardening these steels are given, and a standard list of extras is included.

Leather Belting.—E. F. Houghton & Co., Third, American and Somerset streets, Philadelphia. Form No. 9641. Pertains to a line of leather belting composed of three different brands. The advantages and uses of these are briefly

touched upon, together with a short description of the construction. A list of sales departments and agents is included.

Punching, Bending and Shearing Machinery.—Hendley & Whittemore Company, successor to Slater, Marsden & Whittemore Company, Beloit, Wis. Catalog No. 9. Calls attention to a line of hand and power operated punching and shearing machines and plate-bending rolls of the pyramid and initial types. Illustrations and brief descriptions of the various machines are presented, together with condensed specification tables for the several sizes of each that can be supplied. Mention is made of a line of wood working machinery, which includes swing, cut-off, self-feed rip and combination rip and cut-off saws.

Rail Joints.—Railways Accessories Company, Pioneer Building, Seattle, Wash. Circular. Devoted to a rail joint in which the ends are supported on arched angle bar surfaces that cause reactions to be set up by the pressure of the wheel load, which are simultaneous at each rail end, thus keeping the joint tight.

Gasoline Engines.—Bingo Engine Works, Flora, Ind. Bulletin No. 1. Refers to a gasoline engine equipped with a simple carburetor and having the ignition spark controlled by the governor. A brief description of the various parts of the engine is presented, followed by instructions on starting the engine and clearing trouble that may occur in operation. Illustrations are presented of accessories, such as pump jacks and grinding wheels, and a number of testimonial letters are included.

Sand Blast Nozzle.—W. F. Stodder, P. O. Box 747, Syracuse, N. Y. Circular. Refers to a sand blast nozzle operating on the suction principle, which was illustrated in THE IRON AGE, Aug. 24, 1916. Among the features emphasized in the circular are the elimination of the tank and special sand hose ordinarily required and the fact that practically any grade of sand can be used.

Grinding Wheels.—Abrasive Company, Tacony and Fraley streets, Bridesburg, Philadelphia. Catalog No. 6. Lists a line of grinding wheels which includes vitrified, silicate and elastic wheels, as well as those made from two special abrasives, Boro-Carbone and Electrolon. A table showing the grain and grade of wheel adapted for various classes of work is presented, together with instructions on the use and care of wheels. Numerous engravings of the cup, cylinder and special wheels that can be supplied are presented, and mention is made of a line of rubbing brick and sticks.

Speed Reducing Gears.—D. O. James Mfg. Company, 1120 West Monroe Street, Chicago. Bulletin No. 6. Illustrates and describes a line of speed reducing gears for transmitting from 1 to 100 hp. in ratios ranging from 4 to 1 to 1600 to 1. A description of the general construction of the gears is presented, together with instructions for their installation, and this is supplemented by tables of the various sizes that can be furnished. A number of views of the gears in use are included.

Engineering Construction.—W. S. Barstow & Co., Inc., 50 Pine Street, New York City. Brochure entitled "The Puzzle of Prosperity." Treats of a number of pieces of construction work accomplished by this organization. These include bridges, cement plants, factories, power houses, etc. Illustrations with brief descriptive captions are presented.

Pneumatic Ejectors.—Shone Company, Chicago; Yeomans Brothers Company, 231 Institute Place, Chicago, general sales agent. Bulletin No. P-4000. Deals with a pneumatic ejector for automatically raising sewage and drainage from basements below the level of street sewers, etc. The construction of the ejector is gone into at some length, the text being supplemented by a number of engravings and drawings. Cross-sections of the single and duplex types which are built are included, together with a list of the standard sizes of each, and tables of dimensions.

Electric Grinding Machines.—Van Dorn Electric Tool Company, Cleveland. Circular No. 56. Concerned with a line of electric grinding machines which includes the external, aerial and bench types. Brief descriptions of all three machines are given, the text being supplemented by engravings.

Squirrel Cage Fans.—Consolidated Engineering Company, 507 West Jackson Boulevard, Chicago. Bulletin No. 1. Illustrates and describes a line of modified squirrel cage fans for which the particular advantage of great capacity in a small space is claimed. The fans are adapted for all classes of work done by steel plate fans with the exception of moving materials. A description of the construction is presented, followed by a diagram of the standard arrangements and discharges and tables of data and dimensions.

Tractors.—La Crosse Tractor Company, Minneapolis. Booklet entitled "A Lesson in Arithmetic." Points out the advantages of using a tractor instead of a horse for hauling. While the points are brought out in connection with the use of a tractor on a farm, they are nevertheless applicable to industrial plants. A brief description of the various sizes of tractors built is included.

Electric Meters.—Sangamo Electric Company, Springfield, Ill. Two bulletins. The first, No. 45 superseding No. 36, is concerned with a mercury motor type of amperehour meter. The construction of the meter is gone into in considerable detail, the text being supplemented by a number of line and halftone engravings of the several parts of the meter and the different types made, and its application to various uses is discussed. The other bulletin, No. 46 superseding No. 40, gives a detailed description of the construction of a watthour meter for use on single-phase and polyphase alternating-current circuits. The description is supplemented by a number of engravings of the different parts. Instructions for its installation and adjustment are presented, together with data on the performance characteristics.

Apparatus for Chemical and Allied Industries.—J. P. Devine Company, Buffalo. Miniature bulletin No. 105. Relates to the apparatus required by the chemical and allied industries. This includes autoclaves for both low and high pressures; reduction, nitrating, fusion, chemical and tilting kettles; vacuum pans and evaporators, jacketed pans, digestors and steam-jacketed valves and pipes. A single page is given to each line of apparatus with an engraving, brief description and information as to the uses to which it may be put.

Hydraulic Machinery and Fittings.—Southwark Foundry & Machine Company, Philadelphia. Loose-leaf catalog. Deals with an extensive line of hydraulic machinery and fittings which includes stop, check and operating valves, presses of various types, accumulators, cranes and riveting machines. Each machine or fitting has a separate page in the catalog, with an illustration and brief description, and in some cases table of specifications or dimensions. Mention is made of the facilities of the company to build special machinery to order, and a number of tables of useful information are included.

Oxy-Acetylene Welding and Cutting.—Peter A. Frasse & Co., Inc., 45 Boulevard, Hartford, Conn. Folder. Treats of the use of the oxy-acetylene process for repairing parts made of aluminum, bronze, brass, copper, steel and iron, as well as the cutting and wrecking of wrought-iron and steel structures, boilers, tanks, stacks, etc. Engravings of welding and cutting operations that have been performed are presented.

Portable Electric Drilling and Grinding Machines.—Independent Pneumatic Tool Company, Thor Building, Chicago. Circular Y. Shows an extensive line of portable electric drilling and grinding machines equipped with universal motors for use on either direct or alternating current circuits. There is but little text in the circular, reliance being placed almost entirely on engravings of the tools and tables of the sizes than can be supplied to tell the story.

Vacuum Pumps.—Ingersoll-Rand Company, 11 Broadway, New York City. Two catalogs, Nos. 3037 and 3038. Contain illustrations and descriptions of straight line and duplex types of dry vacuum pumps respectively. The descriptive matter is supplemented by numerous engravings of the various parts of the pumps, and specification tables are included.

Turret Lathes.—Gisholt Machine Company, Madison, Wis. Circular. Describes briefly and illustrates some of the pieces that can be finished on its standard turret lathe equipped with chucking tools. In connection with each piece, dimensions are given and a statement of the time required for finishing it. A partial list of users of these lathes is included.

Rust-Proof Coating.—Hess & Son, 1031 Chestnut Street, Philadelphia. Pamphlet. Pertains to the Epicassit process for rust-proofing metal articles or structures of all kinds. This material, which is a metal powder that is mixed with a liquid carrier to the consistency of a thick paint, is applied with a brush and then melted on with a torch or in a furnace. It is made in five brands to meet the various requirements, and the different grades made are briefly described with short statements of the uses to which they may be put. Instructions for applying the material are presented with a concise announcement of its advantages, such as ease of application, uniformity of coating, resistance to heat and cold and proof against mechanical abuse.

Drill Rods.—Spencer Wire Company, Worcester, Mass. Circular No. 59. Calls attention to the facilities possessed by this company for the production of round bright polished high-speed steel drill rods. Special emphasis is laid upon the uniformity of the hardness through each bar; the slight variation from the specified size, not more than 0.00025 in. either way, and absolute roundness.